

Barriers and Enablers to the Wider Adoption of e-Infrastructure

e-Uptake project team

e-Uptake Overview

- Led by National Centre for e-Social Science in collaboration with the National e-Science Centre and Arts & Humanities e-Science Support Centre.
- Aim to provide evidence base for targeted interventions and strategic planning which will enable widening uptake of e-Infrastructure across all disciplines.

Approach

- Develop a broad empirical basis for understanding barriers and enablers for adoption of e-Infrastructure:
 - look beyond isolated, contingent or random problems
 - identify recurring, widespread barriers that can be overcome by targeted interventions and longer term planning

Data Gathering

- Phase 1: 50 interviews with researchers drawn from across the main disciplines.
- Phase 2: 50 interviews with ‘intermediaries’ in HEI IT services:
 - mix of established, ‘aspirational’ HEIs and small, specialist research institutions
 - aimed to have 2 interviewees per institution:
 - one at strategic level
 - one with direct user support role
- All interviews recorded, transcribed and coded for analysis.



Analysis

- Transcripts coded up using a typology developed from literature review and subsequently evolved in light of emerging findings.
- Online database of findings to allow stakeholders to browse or search corpus of findings.
- Data represented in XML format to allow automatic processing and easy transformation into different presentation formats.

Typology of Barriers

- Typology used to analyse findings and to facilitate browsing.
- Based on literature review.
- Iterative refinement in the light of data.

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Database of Findings

Title ←

Description ←

Examples
from Fieldwork ←

Enablers ←

INSIDE COLLECTION (REPORT):

[e-Research Community Engagement Findings](#)

[NEXT >>](#)

Report by: [Alex Voss](#)

Inhibitor: Access to Access Grid Nodes and Overheads in Arranging Meetings

Module by: [Alex Voss](#)

Running effective Access Grid Meetings requires access to properly maintained Access Grid nodes. The most effective way of using the Access Grid is through room-based nodes, especially when more than one person is joining the meeting from a site or when a larger number of participants are taking part overall. However, the best maintained room-based nodes are often also the most heavily used ones, limiting access to the Access Grid. In addition, running a successful meeting requires some expertise in managing a session but institutions often struggle to make support arrangements. As a consequence, even when nodes are available, usage can be limited by the lack of local support.

As a consequence, organising Access Grid sessions can be difficult as this involves securing access to a number of different nodes for participants in different locations. Arranging a meeting requires the coordination of these technical and organisational resources as well as the coordination of participants.

EXAMPLE 1: Lack of availability

I would love to be able to use AGN from my PC with a webcam the same as in the lab if possible. One of the big barriers to collaboration is organising meetings and the bigger the group the more difficult it gets to organise a meeting.

EXAMPLE 2: Lack of local support

they won't let us use the node if there's not someone on site trained to drive it was the bottom line, they weren't in the situation for quite some time to be able to provide someone to drive it, so it was a bit of a catch twenty two for us. I think the node here, there was an attempt to try and make it pay for itself or make it generate money, and people stopped using it and therefore the service was very sketchy but we were still quite reliant on it.

EXAMPLE 3: Effective access determined by lowest common denominator

we also use Access Grid only with those that we know there is a very good Access Grid support, so it's wonderful for our collaboration with [other university] and with [other university], it works brilliantly for our collaboration with [other university], but all of those centres have very good support. [Other university] isn't using it anymore, they have dropped it, so we are not using it with [them] anymore.

Enablers

- It is possible to install a small Access Grid node on an ordinary desktop computer with a camera, speakers and microphone. [I20COM](#) offer a desktop version of their Access Grid software and the [Access Grid Toolkit](#) provides a free alternative.
- Researchers at the University of Manchester a building a [Portlet Access Grid](#), that allows Access Grid sessions to be initiated from a web browser.
- The [Access Grid Booking System](#) provided by JANET in the UK provides a way to book Access Grid nodes and to schedule meetings. However, it does not cover all cases, e.g., rooms may need to be booked locally or may have other constraints imposed on them.

Collection home:

[e-Research Community Engagement Findings](#)

Next module >>

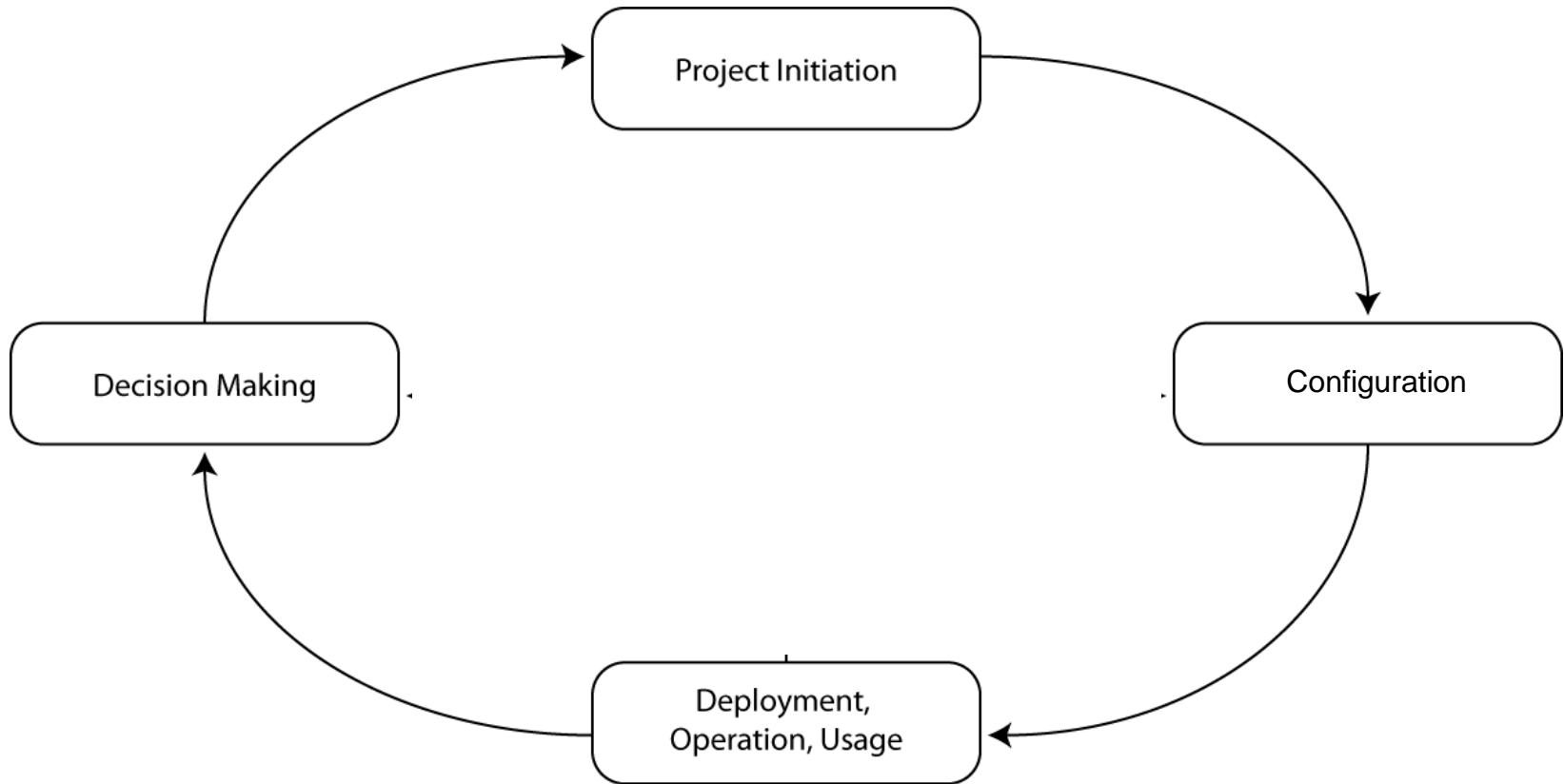
[Inhibitor: Access Regulations for Data Sets](#)

Comments, questions, feedback, criticisms?

Send feedback

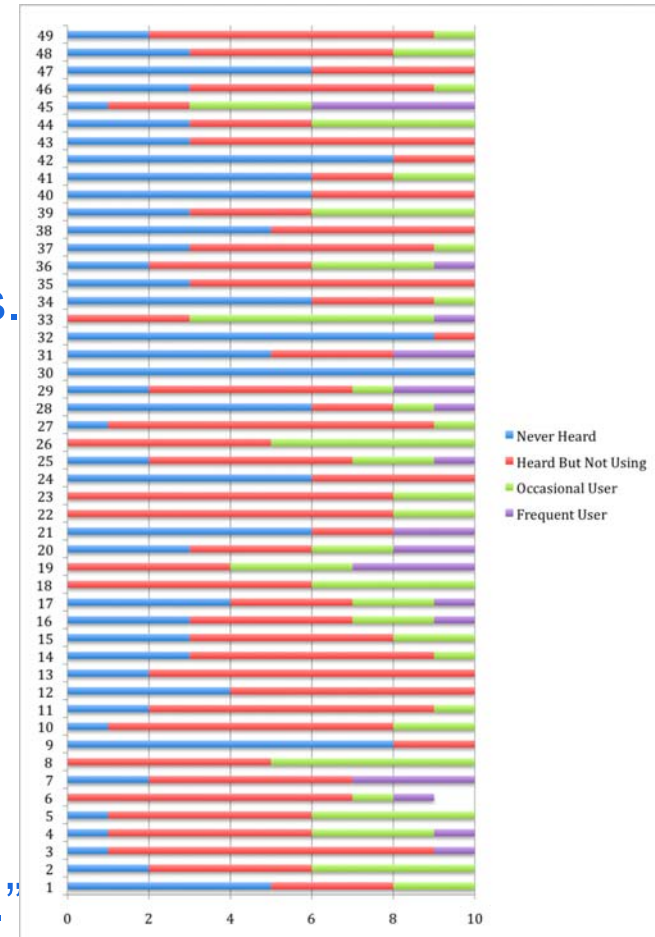
- [E-mail the author of this content](#)

Stages in the Research Tools Lifecycle



Barrier: Lack of Awareness

- Lack of systematic introduction to the services and the training available.
- Support and outreach activities varied significantly between different kinds of institutions and between different disciplines.
- Awareness of services provided within an institution is systematically reported to be higher than that of equivalent services provided elsewhere even if those have a national remit.
- “The big problem we face is people write their proposals, run into problems, come to us, but in their proposal [nothing] was mentioned about computing or visualisation.”



Enabler: Awareness Raising

- “[...] So I would suggest a sort of travelling roadshow – give presentations, go round different universities, you know, show them what’s available, show them how it could be useful.” (Researcher)
- “Having stuff where you can show that people have done really new science using those tools [...] it seems to be working quite well in terms of getting engagement and we're seeing that other communities just like these things – like the systems biology communities are beginning to be very keen to play and join in.”



Barrier: Assessing Costs of Adoption

- “I can see that there are things there which we probably could be able to use in the future but first we’d have to work out how. There are projects, for example, like OGSA-DAI and OGSA-DAI has some features which I can see they would be useful if we had skills or if we had the time to actually be able to get far enough into the technology to be able to actually utilise it properly.” (Researcher)
- “It was very difficult in the early days for me to see what Grid could do for me kind of thing, and therefore [...] It’s getting a lot better now, but initially there was, for a very selected community, large scale facilities and problems and it wasn’t really for me and it was quite difficult to get over that barrier.” (Researcher)
- “So you’re working with products that come out of research rather than out of a software factory, [...] it’s difficult to decipher what the risk is before you start.” (e-Science Centre)



Enabler: Support for Exploring Possibilities

- “I can see that there are things there which we probably could be able to use in the future but first we’d have to work out how.” (Researcher)
- “[...] it would be good to have some pilot funding to really spend some time with [...] to run a pilot experiment to see when there are problems [that] could be addressed by some of the [...] tools.” (Researcher)

Barrier: Technical Complexity

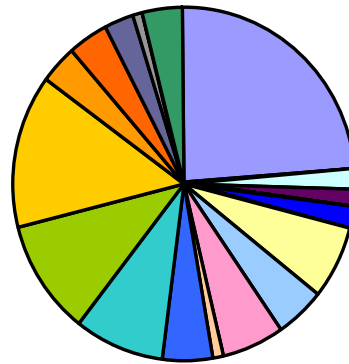
- “[...] grid computing [...] is an under-utilised resource. I think there probably are barriers to people understanding how they could use it, what they could do with it [...] but I’d imagine that there’s a lack of understanding of the technical context.” (IT services)
- “Other projects – not necessarily medical ones, but also engineering ones – where the organisations involved saw the Grid as [a] great looking solution but didn’t want their data to leave their network [...]” (Researcher)

Enabler: Training

- Short courses:
 - Introduction to e-Research, data management, campus Grids, Access Grid, web services, etc.
- Academic courses:
 - Well-developed undergraduate and postgraduate curricula, and (foundational) courses.
- Training support:
 - Shared t-Infrastructure for running training and educational exercises, etc.
 - IPR framework to allow for sharing of educational/training materials.

Training Requirements

■ Training requested in 2008

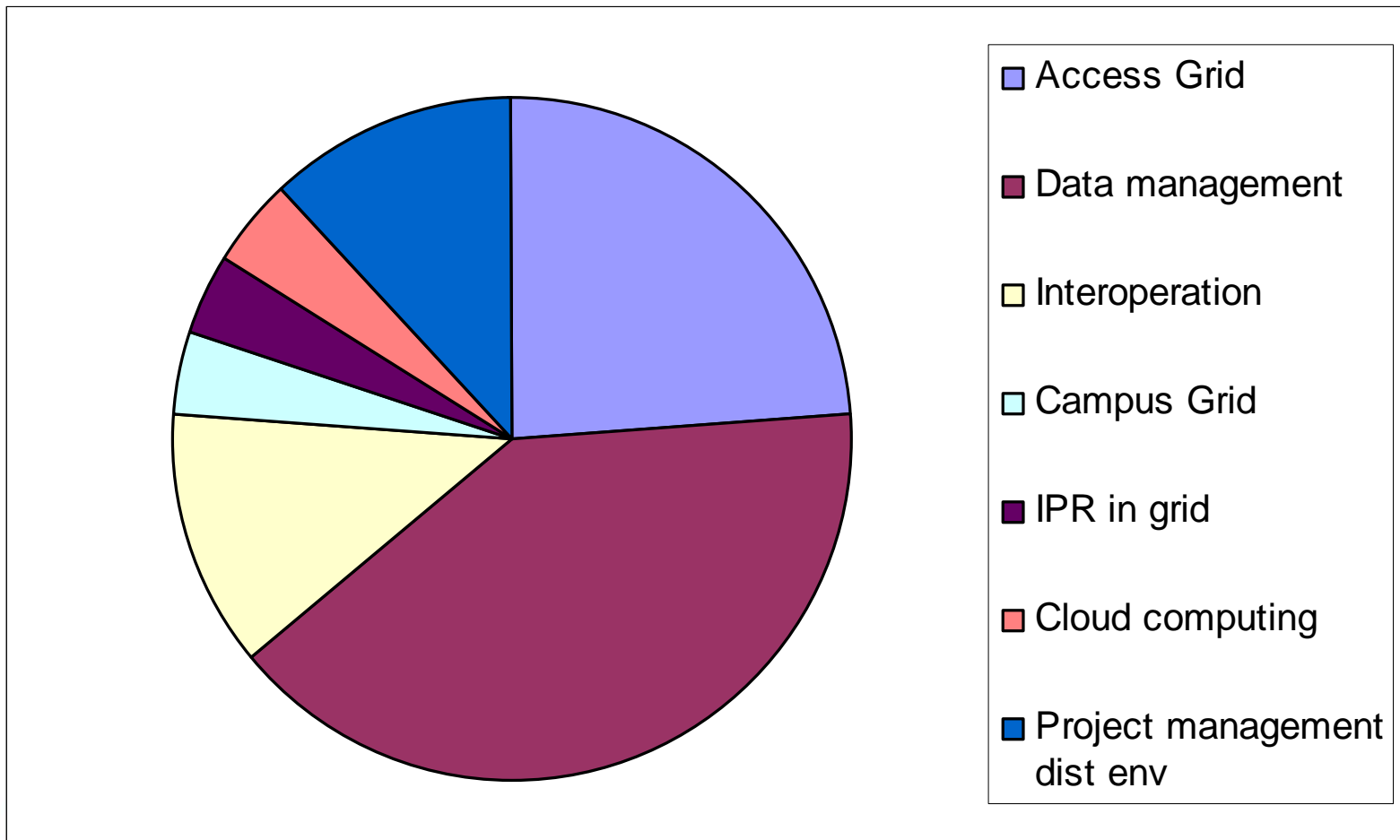


- | | | |
|----------------------|------------------------|------------------------|
| ■ Intro to e-Science | ■ Middleware selection | ■ Digital certificates |
| ■ Porting apps | ■ Web services | ■ WSRF |
| ■ Technology updates | ■ GT4 | ■ OMII-UK |
| ■ Networking | ■ Relational DBs | ■ XML DBs |
| ■ SRB | ■ SGE | ■ Condor |
| ■ OGSA-DAI | ■ SRM | ■ Oracle |
| ■ Metadata | ■ Semantic grid | ■ Workflow |



Training Requirements

- New training requested in 2008





Barrier: Lack of Common Ground

- “I’m not an e-Scientist and it’s one of the things that’s sort of continually frustrating in the field is the assumed terminology if you know what I mean? There’s a lot of terminology that’s come over from computing science which is never designed for the rest of us who actually do the science [...]” (Researcher)
- “It is hard though because people talk different languages and you’ve got to learn to understand each other’s languages and what different people are doing. And see how they can merge together.” (IT Services)
- “There’s a general need for more training that’s aimed at the domain experts rather than e-Science experts.” (Researcher)



Enabler: Greater User Engagement

- “Maybe now [IT services] need to get back and think about helping people with what it is they want to use computers for.” (Researcher)
- “IT services has [...] academic liaison directors whose task it is to speak to the users and their colleges. [There are] monthly stakeholder meetings, and [liaison staff] go out and meet with the research groups.” (IT services)
- “There is a need for more people to sit down with scientists and work with them on their specific applications [...] people that understand both applications and also understand how to grid-enable them.”(Researcher)
- “[...] we had to do the focus groups and it meant that we could be closely involved with all these people coming in and saying what were the barriers to them using a national data service, but it was the contact with the users that was great.” (IT services)



Barrier: Lack of Wider Integration

- In an e-Research world, support infrastructure has to be fit for purpose *everywhere*.
- “[...] we had hoped when Access Grid started that it would develop and become something that we could have on our desktop, in fact we use it much less now. We use Access Grid only with those that we know there is a very good support, so it’s wonderful for our collaboration with [...] and [...] but all of those centres have very good support [...]” (Researcher)

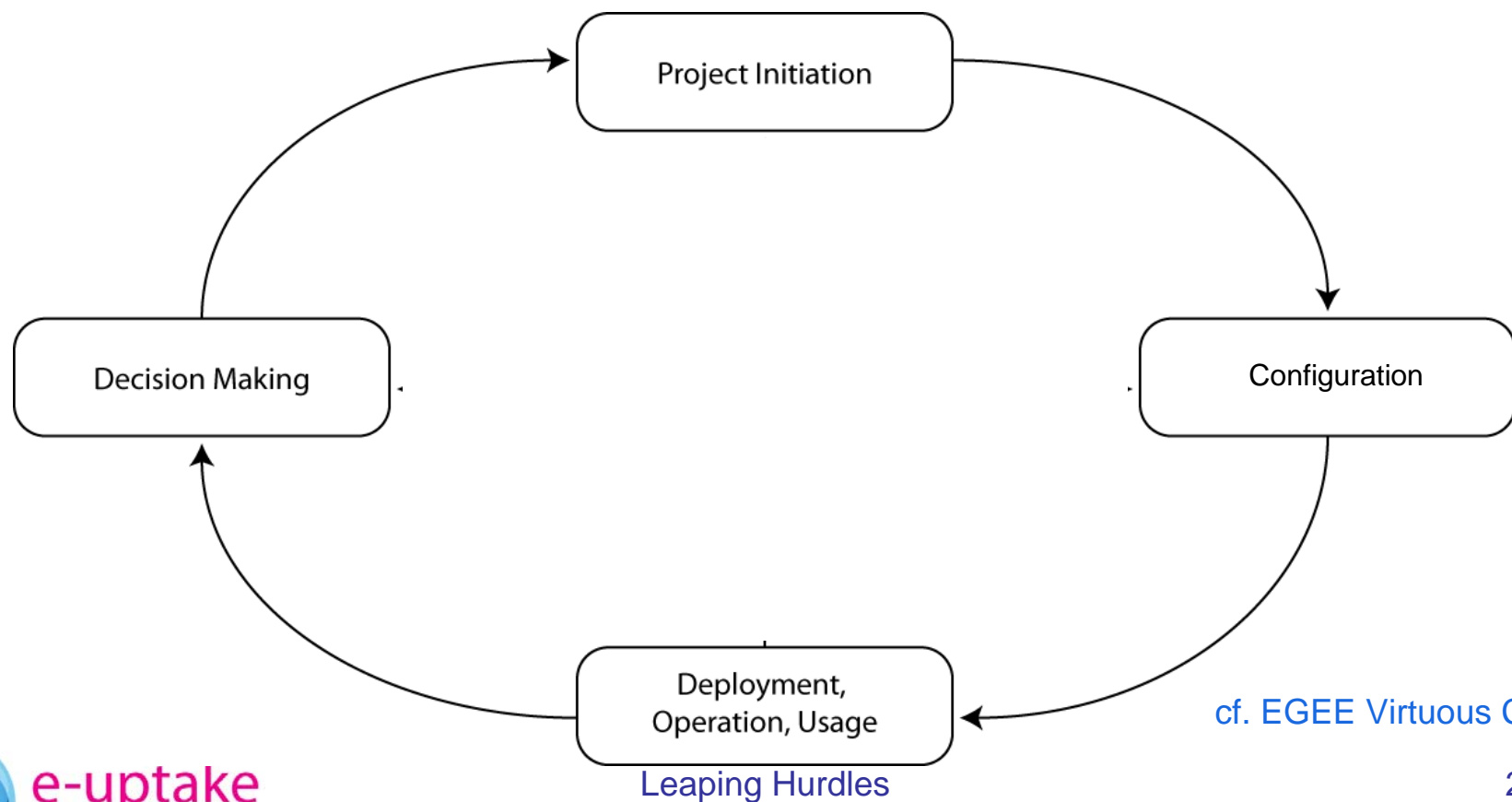


Enabler: Re-alignment of Support Infrastructure

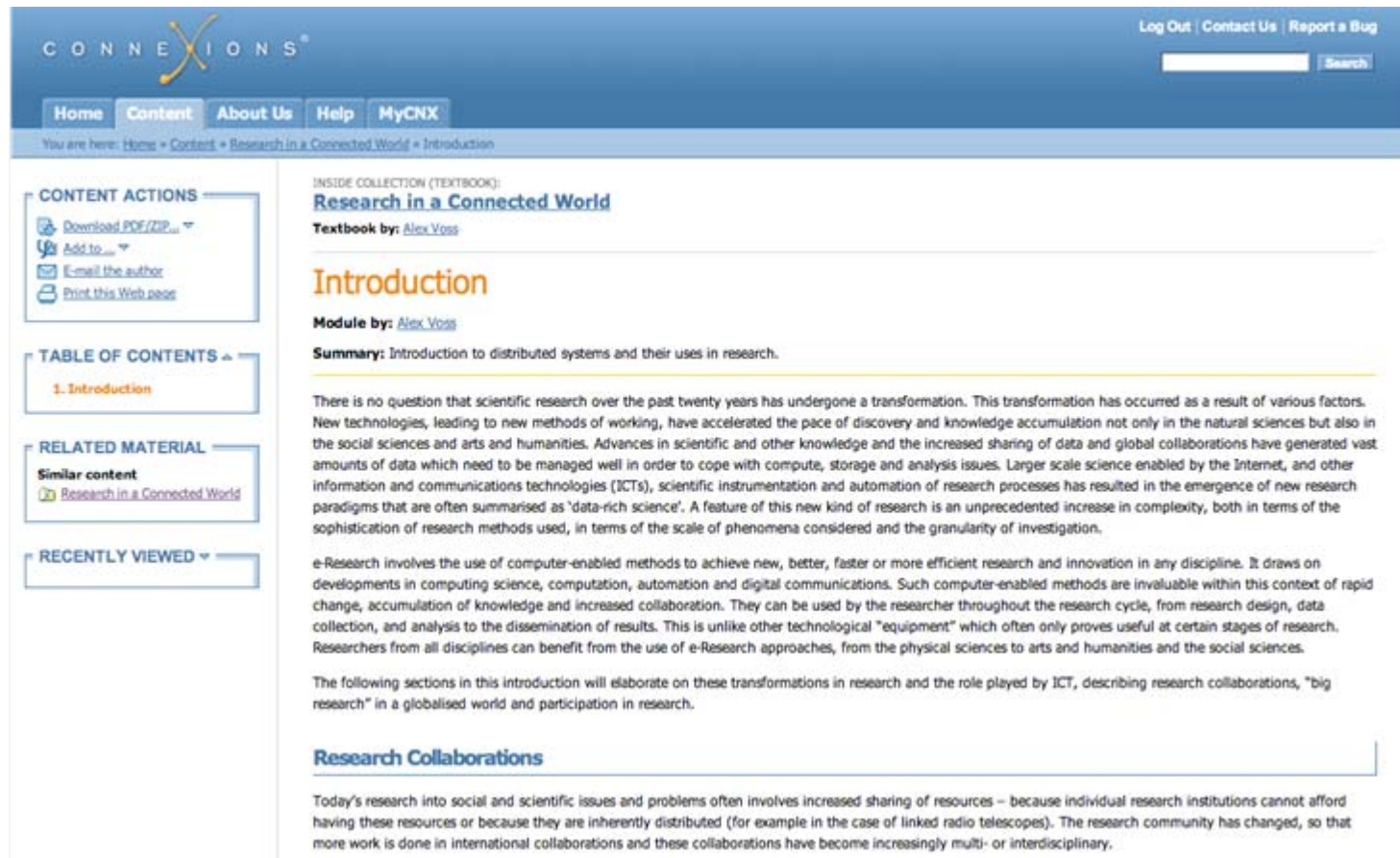
- Support services must devise business models that are acceptable to users and which ensure that the services they offer are sustainable.
- “I think the [AG] node here, there was an attempt to try and make it pay for itself or make it generate money, and people stopped using it and therefore the service was very sketchy but we were still quite reliant on it.” (Researcher)
- Support services (both local, regional and national) must work more closely together to share their expertise, raise standards and establish common practices and policies.
- “It is important that JISC explain to the community what facilities there are, so that we can share that with our users.” (IT Services)

Enabler: One-Stop Shop

- Closing gaps between stages of engagement through a more effective support infrastructure.



Interventions



The screenshot displays the Connexions website interface. At the top, the logo 'CONNEXIONS' is visible, along with navigation links for 'Home', 'Content', 'About Us', 'Help', and 'MyCNX'. A search bar is located in the top right corner. The breadcrumb trail indicates the current location: 'Home > Content > Research in a Connected World > Introduction'.

CONTENT ACTIONS

- Download PDF/ZIP...
- Add to ...
- E-mail the author
- Print this Web page

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- 1. Introduction

RELATED MATERIAL

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- Research in a Connected World

RECENTLY VIEWED

INSIDE COLLECTION (TEXTBOOK):
Research in a Connected World
Textbook by: Alex Voss

Introduction

Module by: Alex Voss

Summary: Introduction to distributed systems and their uses in research.

There is no question that scientific research over the past twenty years has undergone a transformation. This transformation has occurred as a result of various factors. New technologies, leading to new methods of working, have accelerated the pace of discovery and knowledge accumulation not only in the natural sciences but also in the social sciences and arts and humanities. Advances in scientific and other knowledge and the increased sharing of data and global collaborations have generated vast amounts of data which need to be managed well in order to cope with compute, storage and analysis issues. Larger scale science enabled by the Internet, and other information and communications technologies (ICTs), scientific instrumentation and automation of research processes has resulted in the emergence of new research paradigms that are often summarised as 'data-rich science'. A feature of this new kind of research is an unprecedented increase in complexity, both in terms of the sophistication of research methods used, in terms of the scale of phenomena considered and the granularity of investigation.

e-Research involves the use of computer-enabled methods to achieve new, better, faster or more efficient research and innovation in any discipline. It draws on developments in computing science, computation, automation and digital communications. Such computer-enabled methods are invaluable within this context of rapid change, accumulation of knowledge and increased collaboration. They can be used by the researcher throughout the research cycle, from research design, data collection, and analysis to the dissemination of results. This is unlike other technological "equipment" which often only proves useful at certain stages of research. Researchers from all disciplines can benefit from the use of e-Research approaches, from the physical sciences to arts and humanities and the social sciences.

The following sections in this introduction will elaborate on these transformations in research and the role played by ICT, describing research collaborations, "big research" in a globalised world and participation in research.

Research Collaborations

Today's research into social and scientific issues and problems often involves increased sharing of resources – because individual research institutions cannot afford having these resources or because they are inherently distributed (for example in the case of linked radio telescopes). The research community has changed, so that more work is done in international collaborations and these collaborations have become increasingly multi- or interdisciplinary.



Interventions

- JISC eRoadshows to introduce e-Science.
- “Research in a Connected World” introductory pamphlet and framework for introductory text book.
- One-Stop-Shop for training events and materials linking to EIUS use cases and eUptake barriers in ENGAGE portal.
- Specialised training events:
 - Art & Humanities – “searching Shakespeare using OGSA-DAI”
 - Social science – “Modelling populations”



Summary

- e-Infrastructure is often seen by its users (both current and potential) as complex and challenging:
 - Current users experience frustrations, potential users are unaware of its benefits and how to take the first steps
- Support services sometimes fail to provide access to the right information and advice:
 - Closer collaboration between local support services and users for a better understanding of requirements and what is possible
 - Greater of integration between service providers at the national level and support services at the local level
- We need to address how the support infrastructure might be reconfigured so that it is pervasive, accessible and fit for purpose.

cf CIR Strategy report http://wikis.nesc.ac.uk/escienvoy/Century_of_Information_Research_Strategy



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- AHeSSC:
 - Elpiniki Fragkouli, Stuart Dunn, Sheila Anderson, Lorna Hughes.

e-Uptake Project Links

- Community Engagement Projects Portal:
 - <http://www.engage.ac.uk/>
- e-Uptake Project:
 - <http://engage.ac.uk/e-uptake>
- Database of findings:
 - <http://cnx.org/content/col10677/latest/>