Jisc and CNI invitational roundtable 3 July 2018

Summary of discussions and directions for future work

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Introduction

This report summarises the main discussion themes and the opportunities for future work that were identified at a roundtable of invited UK and US library and information technology leaders on 3 July 2018 in Oxford, UK. The roundtable was convened in as part of the 2018 Jisc CNI leaders conference (jisc.ac.uk/events/jisc-and-cni-leaders-conference-02-jul-2018).

The challenge

Digital technologies and techniques are changing how research is done, and the pace of that change is accelerating. Research leaders have recognised, and often been instrumental in, that change. We see this in evolving open science policies and in the creation of international research infrastructures. But what does a future sustainable global infrastructure underpinning open scholarship and the research lifecycle look like? How could we bring this vision to life?

This report outlines the dimensions of the challenge and sets out a response, including practical steps for further exploration.

Note: we use “infrastructure” here in a broad sense – the shared tools, systems, platforms and services that researchers rely upon; the organisations and governance processes that surround these technological objects; and the human expertise to create, maintain and support them.

The dimensions

Trust

Researchers must be able to trust the infrastructure that they rely upon to function correctly and reliably, and it to be there when they need it. The evolution and ultimate replacement or retirement of infrastructure components must occur in a planned, measured and responsible fashion. And there are additional dimensions of trust that are becoming increasingly important. One is the nature and transparency of policies surrounding the capture and subsequent reuse of various kinds of personal or restricted information. A second dimension stems from concern about the correctness and reproducibility of various research practices. To the extent that technology is deeply involved in these research practices and the dissemination of various research outcomes, it is essential that provisions be made to support best research practices and facilitate reproducibility.

Researchers' motivations are as complicated as anyone else's. They want to collaborate and to compete for credit, they would like to spend less time on administration; they would like the tools and resources they use to be straightforward and reliable. Often, they prefer to share in a staged way, more with their teams or other colleagues than with the public. The amount of curation, context and packaging needed to make this sharing meaningful increases as its audience becomes more distant and often less expert, with little direct reward for the researcher's investment. They can have mixed feelings about citizen involvement in research. Their motivations and willingness to take risks may vary depending on their career stage.

Universities' motivations are not always the same as those of researchers. For example, a university may sign the San Francisco Declaration on Research Assessment (DORA), but may not be motivated to implement it if it feels that doing so might not align with researchers' perceptions of what is important for their careers, as those career horizons stretch beyond that university.

Openness

Open scholarship was originally framed as a set of values that emphasised very broad public access to research outcomes. As funders have recognised the benefits of open scholarship, they have increasingly come to mandate these practices. In some settings, open scholarship risks becoming a compliance burden, with few obvious direct benefits for the researcher or for the university. It is possible that openness is becoming a matter of compliance and, at best, a necessary condition for participating in a research community, rather than being felt to be a rewarding part of good research practice. Often it is unclear what kinds of infrastructure might help reduce the compliance burdens on researchers and also provide ways for them to reap benefits of open scholarship that are meaningful to them.

Funding

Infrastructure tends not to be exciting or new. It is ongoing and utilitarian. It just works. Some scholarly infrastructure is in the hands of universities, or related not-for-profit organisations; other parts of the infrastructure are developed or operated by the private sector. Some, alarmingly, are volunteer efforts that rely upon a few individuals but have found wide adoption (notably some open source software projects fit this description). Some, like the open web, have become almost invisible, perhaps dangerously so. Research funders do fund infrastructure, both directly and indirectly, though direct funding often uses mechanisms that are sometimes very inappropriate for the purpose. Institutional IT departments also fund infrastructure, though there was some concern that IT professionals with increasingly commercial backgrounds may not be sensitive to all the ways in which academics develop and use tools. And, of course, research libraries fund infrastructure both directly and indirectly.

Complexity

While research itself is complicated, researchers' time is also spent dealing with other forms of complexity, such as the various research support roles that exist within and beyond institutions, the range of policies – ethical, data protection, open research, funder and publisher – that might apply to their research, and the myriad of digital tools that are available to use, each with a different business model and evolving features. Institutions that help their researchers manage this complexity, without limiting their research options, are likely to create good research environments.

Rate of change

In common with other sectors, research is adopting digital techniques at a pace and scale that is outstripping its formal social and institutional contexts, and sometimes even its regulatory frameworks.

Roles

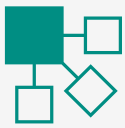
Changes in research practice are creating essential new roles that are part of the effective research teams: software developers, data stewards, research network engineers. There are problems with providing secure funding and reasonable career paths for these important, talented and dedicated individuals.

A response: an expanding web of collaborations

While collaboration can be time-consuming and difficult, it can address many of the dimensions of the challenges outlined above. Collaboration within the academy can help it engage more effectively with the market, for example influencing products, encouraging competition or addressing market failure. It can also help researchers and professionals understand their shared interests. In particular:

Procurement

Commercial services evolve quickly and seek maximum return. Universities can collaborate to become more intelligent and strategic customers who can influence product development, terms of use and/or price, to ensure the market meets research needs and norms. This will require a focus that looks beyond very short-term cost minimisation.



Infrastructure service provision

Where institutional infrastructure constrains researchers, they may use commodity tools (eg cloud storage services for data, github for code, YouTube for video storage and distribution) that meet their needs. Fragmented choices driven at the individual faculty level with little visibility at the institutional level creates risks for institutions, fails to leverage scale and often leaves the researchers with tools not really designed to meet their specific needs. We have many examples of infrastructure developed specifically for researcher needs on a deliberate, large-scale basis: notable successes would include national research networks (eg the Janet Network, provided by Jisc, and Internet2), or developments such as eduroam (the global wifi roaming service that allows any user from a participating site to get network access at any institution connected to eduroam). A similar global academic service for data storage is perhaps overdue, and there may be opportunities in publishing services.

Governance

Where infrastructure tends to evolve into a natural monopoly, or risks becoming a commercial walled garden, then academic collaboration can give rise to governance structures that minimise the risks.

Disciplines

There is some concern that science, technology, engineering and maths (STEM) subjects can receive undue attention in open scholarship. Since the bulk of research funding goes into STEM areas, and many STEM-related developments are of great public interest, this is not hard to understand. Collaboration among the arts, humanities and social sciences can ensure their voice is heard at the institutional level and beyond.

Collective action problems

Some changes, for example in researcher incentives and recruitment or assessment practices, are difficult for institutions to enact alone, as they are manifestations of researcher career and reward structures and cultures that are global.

Managing change

There are many moving parts to scholarly infrastructure, and significant change is not without risks. Collaboration can support mutual understanding, for example between professionals and researchers, institutions and learned societies. The consultations in developing the FAIR principles (a set of guiding principles to make data findable, accessible, interoperable, and reusable) show the value of this, but conversely, we need to be better at sharing and learning from our failures.

Campus support service provision

Collaboration between units within an institution can be as helpful, and as difficult, as collaboration between institutions, but can make a huge difference to researchers' lives.

Future directions

Reflecting on the themes outlined above, the participants at the Jisc and CNI roundtable suggested the following practical steps for possible further exploration. These areas are under active consideration by Jisc and CNI as well as other organisations (such as the Association of Research Libraries (ARL) and EDUCAUSE) both represented at the roundtable, as possible areas for collaborative initiatives or for work by individual organisations. There are complex tradeoffs concerning when to address these at institutional, national or international levels. We invite other organisations with initiatives in these areas to get in touch as we further develop our thinking and our strategies.

A compelling concern was how to re-focus our efforts on making researchers more productive: to focus on offering effective support services to researchers attempting to meet funder mandates that permit them to devote minimum effort to responding to these requirements while still meeting the growing audit and related compliance demands imposed by institutions, funders, and governments. Participants were struck by the apparent

lack of data about where researchers were actually spending their time and the extent to which addressing funder mandates and institutional reporting requirements were diverting researcher time from their primary responsibilities. There were suggestions that studies of researcher behaviour would be very fruitful. Cautions were raised about the difficulties of moving ahead here on an international basis (given that the requirements of various national-level funding bodies varied greatly) and also that institutional concerns (for example, problems with human resources or grant accounting systems) might dominate such studies.

One of the great opportunities that was identified was the possibility that researchers and their institutions, working together and informed by what we might learn in such an effort, might be able to communicate those insights back to funding bodies/agencies as guidance about the implications of reshaping their mandates and compliance criteria. Additionally, a central part of such a discussion would be the potential for the collaborative development of infrastructure that helps researchers with compliance, and ways in which mandates could be adjusted to be more accommodating to infrastructure solutions.

A second thread of conversations tried to connect the institutional perspective with the imperative to focus on the researchers. It seems clear that there are a number of infrastructure components that are very fragile and at risk, or are facing sustainability challenges. The challenge here is how to identify and prioritise these components, and then how to bring collective institutional responses to bear. A good deal of preliminary work has been done in this area, and there are some valuable initiatives such as the Global Sustainability Coalition for Open Science Services (SCOSS) and Joint Roadmap for Open Science Tools (JROST), but much more will be required. We will also need to understand the national-international tradeoffs.

Considerable concern was expressed about the long-term stability of local institutional infrastructure, and the lack of understanding of how precarious some components are. An emerging trend that calls for careful consideration is the repackaging of open source software packages into network-based "software as a service"; in some cases this may be an opportunity to provide better funding stability for key software.

There was extensive discussion about how information technology innovation could be advanced in institutions, particularly given the pressures on administrative computing support, legal compliance and related challenges. One important route was to engage with procurement processes, regulations and organisations to attempt to move towards a more strategically focused approach to supporting innovation in areas that support research.

There was a considerable interest in the possibility of trying to re-invigorate dialogue among libraries, scholarly societies and faculty on how best to support researchers and advance the research enterprise. A part of this was a possible new focus on institutions as conveners of conversations among local faculty engaged in the scholarly communications system as authors, editors, editorial board members, reviewers and society officers. Another strand was a revitalised discussion of economic implications of policy decisions by scholarly societies regarding their publications. Of central importance are strategies for connecting the changing processes of research and the dissemination of that research with the ongoing work of scholarly societies.

Planning is underway for the next Jisc and CNI conference in the summer of 2020. This will be an excellent opportunity to report on progress on these issues and opportunities, and also focus more deeply on specific areas that were identified in this roundtable.

About CNI

The Coalition for Networked Information (CNI) is a joint programme of the Association of Research Libraries (ARL) and EDUCAUSE that promotes the use of information technology to advance scholarship and education. Some 250 institutions representing higher education, publishing, information technology, scholarly and professional organisations, foundations, and libraries and library organisations, make up CNI's members.
Learn more at **cni.org**.

About Jisc

Jisc is a not-for-profit providing the UK's national research and education network, Janet, and technology solutions for its members – colleges, universities and research centres. It is funded by the UK higher and further education and research funding bodies and member institutions.

Jisc does three main things for its members:

- Operates and develops the super-fast and secure Janet Network and its built-in cyber security protection
- Helps save time and money by negotiating sector-wide deals with IT vendors and commercial publishers
- Provides trusted advice and practical assistance on digital technology

Jisc's vision is for the UK to be the most digitally advanced education and research nation in the world.