FIGIT, eLib, Ariadne and the Future.

Marieke Guy, **Philip Hunter**, **John Kirriemuir**, **Jon Knight** and **Richard Waller** look back at how Ariadne began 20 years ago as part of the UK Electronic Libraries Programme (eLib), how some of the other eLib projects influenced the web we have today and what changes have come, and may yet come, to affect how digital libraries work.

Ariadne is 20 years old this week and some editorial board members thought it might be useful to look back at how it came to be, how digital library offerings have changed over the years, and maybe also peer into the near future. To do this, we've enlisted the help of several of the past editors of Ariadne who have marshalled their memories and crystal balls.

Back to the beginning...

The story of Ariadne actually begins in the early 1990s. From the late 1980s onwards there had been a notable growth in student numbers, and 1992 saw the binary divide between Universities and Polytechnics swept away. It was also a period that saw rapid developments in information systems, computer networking, monograph and journal pricing and the need for IT literacy in both teaching and research. With this background the four funding councils that cover England, Wales, Scotland and Northern Ireland convened a Review Group in 1992 to investigate the new challenges facing academic libraries, and propose some potential ways to tackle them. This group was chaired by Professor Sir Brian Follett and the report they produced a year later in 1993 became known as the Follett Report [Follet1993].

One of the conclusions of the Follett Report was that libraries in the academic sector would be affected by developments in IT systems. Students were seen as being more aware of different sources of information, and both they and University staff wanted networked access to as much of it as possible at their desks. However we have to bear in mind that at that stage the World Wide Web was still relatively new [Berners-Lee1996], and searching on the Internet was still in its infancy. Philip Hunter remembers that period well:

> 66 *How small the internet was in March 1994, when I first had access! And navigation was tricky. There were three main options for getting around: use lists of sites on already known sites, explore via a random URL generator, or search the internet for resources with Gopher, which was effectively a real-time site crawler, and it could take twenty minutes or so to report back. There were no proper search engines as such for the web till about 1996. That's hard to believe now. Yahoo existed, but it wasn't a proper search engine at the time. Google grew out of the Stanford University search engine, which officially became Google in 1998.* 99

The Follett Report was well received and lead to the funding councils allocating £4.75 million in 1994 to help fully implement its recommendations. The funding councils tasked the Joint Information Systems Committee (JISC) to administer these funds, and they in turn created a sub-committee called the Follett Implementation Group on Information Technology (FIGIT) [JISC1994]. This led to a number of "FIGIT-funded" Electronic Library Programme (or "eLib") projects being set up covering electronic document and article delivery, electronic journals, digitisation, on-demand publishing, training & awareness and access to networked resources [UKOLN2001].

One of the recipients of such funding was Ariadne. Set up initially with both a print and electronic version, it rapidly became the place the JISC-funded eLib projects reported their meetings, news and results, as well as a place that librarians in a range of institutions could share knowledge. Before Marieke Guy became one of our editors, she had experienced Ariadne as a student:

> 66 *I first encountered Ariadne while studying for an MSc in Information Management at Manchester Metropolitan University in 1997. It had recently been created to support the UK Electronic Libraries Programme (eLib) and was available both offline (as a glossy printed magazine) and online. To a young librarian it struck me as pretty cutting edge and made a refreshing change from the usual journal articles that comprised the recommended reading list. Here were people writing in an honest and engaging way about real-world activities in the digital library world! I quoted content in more than a few of my course papers.* 99

After being a student, Marieke then moved from using eLib provided resources to helping keep existing ones such as Ariadne moving forward whilst also building new ones:

> 66 *When I joined UKOLN, a digital information research centre based at the University of Bath responsible for publishing Ariadne, in 2000 as an information officer I began by editing two online web magazines (Exploit Interactive and Cultivate interactive) delivered as part of the dissemination activity for two European projects. It was my first editing role and being let loose on the web filled me with excitement*

and trepidation. Once I'd got the hang of things I began helping the Ariadne editor at the time, Philip Hunter, with bits of editing work. My first published article was a book review for 'Digital Imaging: A Practical Handbook' by Stuart D. Lee, and in June 2001 I managed to persuade Philip to let me write the editorial. Since then I have written over 25 articles for Ariadne ranging from book reviews and event reports to thought and research pieces. Whenever I've had something to say to the information and library profession and I've needed a place in which to say it then Ariadne has come to the rescue. 〞

Of course Ariadne did not stand still as the technology around it changed. The original print version eventually ceased to be produced, and the way the web version was created and delivered also changed. The original Web version that John Kirriemuir edited was simple HTML files marked up by hand using the Notepad program in Windows 3.1. By the time Richard Waller took the helm, there was a need to move on to newer ways of both presenting the material to readers (including ultimately the migration to Drupal) and managing the volumes of articles being generated:

〝 *During the 10 years on my watch for Ariadne (2003-13), Web publishing witnessed a plethora of technological developments ranging across formats, platforms and new media. Undoubtedly the most disruptive of those technologies was Web 2.0 which in some ways had as much an effect upon Web publishing as digital publication had upon the entire publishing landscape.* 〞

The current editorial team have had to continue with this revision of the technologies we use to run Ariadne, whilst at the same time trying to make sure that we provide access to resources that were written two decades ago.

Accessing Networked Resources

The FIGIT funding of eLib projects lead to a number of services being set up. Access to network resources was a major strand in the scheme, and your current editor was lucky enough to be involved with a couple of them, as well as working part time in Loughborough University library trying to make networked CD-ROM products actually work. Metadata became a popular topic of conversation, and the projects were also involved with developments in the wider world such as EU-funded projects [Hartland1997], Dublin Core [DCMI], Warwick Framework [Thiele1997] and the IETF standard process [IETF]. When Philip Hunter became Ariadne editor access to network resources projects were coalescing into the Resource Discovery Network [JISC1999]:

〝 *Things developed very fast in the digital library community in the late 1990s, mostly supported by funding from JISC and other stakeholder organisations. It was obvious within the library community that a standards-based approach to development would be important for usable internet-based services, in a world of competing commercial interests. And that resource discovery was going to be the big thing. By the time I became editor of Ariadne in October 1997 that was the way things were going - the Resource Discovery Network was launched in 1998 in London. Metadata was already very important, but it was surprising how many people did not know what it was.* 〞

The way resource discovery has developed is something we could not predict back in the mid-1990s. When the Follett Report was written and Ariadne was subsequently funded, there was a diverse range of early networked information systems and search tools. The range and quality of data have also changed out of all recognition from those early days. John Kirriemuir, the first Web editor of Ariadne, recalls some of these changes:

〝 *The past 20 years, eh? Well, many things changed; social media came, as did better web browsers. Some things went; gopher, resource descriptions artisanally-crafted by librarians (though the Scout Report is still going), the blink HTML tag, university websites that focused on useful information rather than press releases and shameless alumni begging.* 〞

Philip Hunter pointed out that the eLib projects' consideration of metadata and the idea that the academic community would be building their own search engines around it didn't really come to pass in the end:

〝 *Where are we now? Google does not make use of metadata, and instead uses the text of the pages which it indexes to generate its links. They decided to go down this route on the grounds of the cost of the manual creation of metadata. It works pretty well, though it is not as nuanced as real metadata, and Google doesn't tell the users what their ranking algorithms do to the results of a search, which means it is unclear what you are not seeing, and why. Since academia has not gone down the route of developing its own resource discovery tools, the result is that Google is usually the preferred option for discovery. For now at least, searching with Google Scholar brings up details of where an OA copy of an article may be accessed.*

So resource discovery is pretty well catered for at the moment, with the power of Google search, and the facilities it offers. But gaining instant access to research outputs in general, is not. That struggle will continue for some time yet. 〞

Supporting research was one of the goals of the Follett Report, but it is only now that Research Data Management is being embedded within funding body requirements and institutional processes [RCUK2015]. Richard Waller sees this coupled with "big data" as one of the major developments we are going through:

〝 *Data, Big, Open, etc. To pull the focus more closely upon Research and Scholarly Publishing, during my watch the scientific community reached a tipping point which changed the presentation and above all management of research data. And little wonder, since for the first*

time the number of researchers making reuse of previously collected data exceeded that of researchers obtaining data through their own (increasingly expensive) observations. The whole status of data in publishing changed as methods of collection, analysis and storage evolved. Enter the era of dataset publication in scholarly publishing.

The financial imperative will enforce that trend as funding councils' requirements on data are integrated into research project expectations. The evolution of the area of Research Data Management in the current economic climate will continue apace. 99

Changes in network access and use

One aspect of access to networked resources that a couple of the past editors have noted is actually how the networking is provided, and the devices used. When eLib was being born, networking was very much based on cables with terminals, desktop PCs and workstations attached to them, mostly grabbing data off servers down in the local computer centre. John Kirriemuir identified wireless networking as a post-eLib game changer for resource access:

66 *But the most profound change has been the expansion of wifi coverage. Lovely, sexy, addictive, essential, wifi. Twenty years ago you had to go to a computer which had tubes connecting it to the other tubes of the Internet. Now, in the home, the college, on the bus or train or plane, in the cafe or the library or supermarket, in the bath or on the couch or in bed or the hot tub, Internet Come To You! Take out your laptop, smartphone, tablet, handheld games console and you are connected to whatever or whoever you want. Definitely, the swipe right of the last twenty years.* 99

Similarly Marieke Guy noted that cloud computing, social media and mobile devices have changed the information landscape in the last couple of decades:

66 *Over the last 20 years the information landscape relevant to Ariadne and its readers has completely transformed. The web has enabled access to a huge amount of content and changed how we learn, social media has changed the way we share things, search technology has changed how we find things, cloud computing has changed where we store things and digital data has changed the way we understand things. And let's not forget that tablets, mobile phones and wifi have allowed us to be able to do all of this all of the time. There is no drama intended when we talk of a digital revolution, it's a revolution that I've thoroughly enjoyed observing and participating in.* 99

Richard Waller also noticed the development of social media and the way IT has shaped human interaction as a major change over the last 20 years:

66 *Just as the development of digital platforms had a profound influence upon the dimensions of publication time and content space, so the advent, for example, of social media brought about a paradigm change in the relationship between publisher and reader.*

While innovations on Planet Web 2.0 continue to proliferate I can foresee plenty of further material for editorial comment on an aspect that frequently attracted my interest: the effect of new technology on its users and resultant human behaviour. We have only to consider the effect of the mass migration of content to mobile platforms to see one such radical effect upon our customs. So we will have to come to grips with the disadvantages as well as benefits of those innovations (take, for example, Citizen Science) and not without some pain. We can expect continued difficulties in the handling of social media, and not just for the young. There have been several instances of clever adults failing to grasp the essential point that Web 2.0 makes publishers of us all - and the responsibility that goes with it. 99

Social media is certainly a useful way to engage with students, readers and fellow professionals. The trick is finding the right social media for the right audience at the right time. This can be especially difficult for academic institutions trying to keep up with the tools and sites used by each new intake of students. There often appears to be "fashionable" social media tools that blossom for one group of users for a period of time before people move on to something new or different.

Open Access

Ariadne has always been an Open Access journal, free for both authors and readers. Ever rising costs of journals had been one of the drivers behind the Follett Report, and that is something that is still a problem for many HEI Libraries today, especially with the rapid growth in journal numbers as well. A number of eLib projects (and British Library-funded projects before them [Knight1995]) looked at provision of electronic journals and the digitisation of copyrighted materials.

As well as being an example of an Open Access journal, Ariadne also covered the discussions and arguments around closed versus open access. Again Philip Hunter was editing whilst this was happening:

66 *Open Access became an important concept, partly because of the rising cost of subscriptions to journals, and because electronic delivery of journal articles was already happening. The problem and the apparent solution arrived at about the same time. Ariadne covered the development of OA from the beginning (it was discussed at the eLib conference in December 1999). The next big thing was Research Data Management, which Ariadne also covered in its infancy. In 2003 I stopped editing Ariadne and became part of the research group at UKOLN, and ran the European-funded Open Access Forum, which ran services and conferences for the OA community across Europe.* 99

Open Access had been around before Ariadne and eLib of course. Philip Hunter pointed out one of the early success stories that many have tried to emulate:

> The model for genuine open access is still arXiv, which was originally started as an FTP site, at the end of the 1980s. The community of physicists upload their papers, usually before peer review, and in draft form, and they can be found by searching the site, often within hours. The whole physics community can therefore see the entire body of current research available to them. This may take some time to achieve across other fields of research.

Of course the debates over open and closed access, copyright and the value that traditional publishers add to the academic process continues to rumble on today. Indeed John Kirriemuir suggests that the fact we still have costly printed books might upset some of the fresh-faced eLib workers from the 1990s:

> The most profound thing that didn't change: publishing worthy academic research in dead tree format, at great cost to the reader or their institution, and which hardly anyone reads. It would have surprised and disappointed many, those twenty years ago, that this model still holds sway; the swipe left of academic development since the mid nineties.

Peering into the future

Trying to predict the future more than a year or two out is always a tricky job, though that's really what the Follett Report and eLib set out to do back in the early to mid-1990s. We still try to do it of course, as institutions and funders want to have an idea where to put their money. Today the JISC have a "Futurist" working for them [Hamilton2014] to try to tease out what technologies or social changes might be coming along that will improve or disrupt academic life.

John Kirriemuir has his own thoughts on where the future might take us:

> The future? Once the Greenland ice sheet melt accelerates, academics will discover whether their MacBook Air makes for a good flotation device (it's about the same size and shape as the floats we used in 1970s primary school swimming lessons, so there's hope). Assuming we survive that, the coming pandemic, and four years under President Trump, we should see more haptic net devices, an evolutionary development from the current wave of VR kit. Excellent! I don't want to just see pictures and videos of deep fried butter on a stick at a midwest American state fair; I want to feel, smell and taste and swallow it as well. Through my browser. Think how much improved the Great British Bake Off, or every Nigella Lawson cooking programme, would be when experienced through a full sensory Internet browser. (Jamie Oliver: not so much)
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> What else of the future? After the 2020 election sweeping cuts will be ordered by Prime Minister Boris. Examination passes, from age 6 months to postgraduate level, will be rewarded solely with badges. Siri, replacing teachers, will be sentient and predictive, telling you what you need to know before you know you need to know it. But much will stay as it is. Twitter will still be full of angry work colleagues, and Facebook still full of angry relatives; the Internet will still predominantly consist of cat videos; professors will still reply-all to email; MARC will still be an annoying, and annoyingly used, format; academic meetings will still be utterly pointless; and Birmingham New Street railway station will still have inadequate seating.

Virtual reality, funding cuts and the lingering death of MARC do sound like predictions that could have been heard back in the eLib days. Certainly the pace of change in technology development shows little sign of letting up; our computers get smaller, cheaper and more powerful, whilst the range of information sources continues to grow. Surprisingly none of the previous editors mentioned Artificial Intelligence as a future disruptive technology, despite its promise to help people deal with the large volumes of information available, the large amounts of money being invested into it and the warnings that some smart people are making about its potential downsides.

I think I'll leave the last, positive word to Marieke Guy though:

> Yet despite all this change I still genuinely believe that libraries are more relevant now than ever before. There is a growing movement around openness and access and information professionals have played a pivotal role. The digital world is evolving but there will always be a need for adventurers to help navigate the maze.

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