JISC

february 2010

Toolshed

experimental technologies for universities

Exciting new tools

for researchers, teachers, students, librarians, software developers and research managers

http://bit.ly/jiscri

"THIS WAS AN EXCITING OPPORTUNITY FOR THE LIBRARY TO EXPERIMENT WITH A NEW APPROACH TO DEVELOPING AND ROLLING OUT SERVICES. IT WAS A VERY POSITIVE EXPERIENCE FOR THE PROJECT TEAM, WHO FELT THEY GAINED A GREAT DEAL FROM THIS INTENSE, BUT FLEXIBLE, WAY OF WORKING. WE HOPE THAT THE RAPID INNOVATION METHODOLOGY WILL INFORM HOW WE APPROACH OTHER TECHNOLOGY PROJECTS WITHIN THE LIBRARY – AND WILL ALLOW US TO CONTINUE TO DEVELOP GREAT SOFTWARE SOLUTIONS LIKE THE LIBRARY WIDGETS, WHICH ARE ALREADY BEING USED THOUSANDS OF TIMES EVERY WEEK."

Liz Chapman
Director of Library Services
London School of Economics

"THE UNIVERSITY OF SOUTHAMPTON MANAGED 7 RAPID INNOVATION PROJECTS WHICH HAVE LED TO THE PRODUCTION OF A RANGE OF USEFUL TOOLS AND ENABLED THE UNIVERSITY TO GAIN EXPERTISE AND EXPERIENCE THAT WILL CONTRIBUTE TO FUTURE PROJECTS. THE RAPID INNOVATION APPROACH IS A CREATIVE AND EFFICIENT WAY FOR JISC TO FUND TECHNICAL PROJECTS IN UNIVERSITIES AND ENABLES THE PROJECT TEAMS TO ADDRESS A RANGE OF ISSUES QUICKLY AND EFFECTIVELY."

Professor Dame Wendy Hall,
Professor of Computer Science
University of Southampton

Glossary

API (Application Programming Interface) - an interface which allows one software programme to work with another
Atom - a web standard similar in functionality to RSS (see below)
Cloud computing - the use of shared internet-based computer services
LAN (Local Area Network) - a local computer network for communication between computers
Linked Data - a method of exposing, sharing and connecting data on the web
Middleware - Software that provides a link between separate software applications. Middleware is sometimes called plumbing because it connects two applications and passes data between them.
Rapid Innovation - a method JISC is using to test new technologies using short projects that take an iterative approach to development in order to meets user needs
RSS (Really Simple Syndication) - a web standard that is used to publish information from frequently updated sites such as blogs, newspapers etc.
Semantic web - an evolving development of the web in which the meaning (semantics) of information and services on the web is defined, making it possible for the web to "understand" and satisfy the requests of people and machines to use the web content.
Smart phones - mobile phones designed to use the internet.
URI (Uniform Resource Identifier) - a string of characters used to identify a resource on the web
URL (Uniform Resource Locator) - the address of a webpage or other document on the web
VLE (Virtual Learning Environment) - software that supports online teaching and learning
VoIP (Voice over Internet Protocol) - a telecommunications system that uses the internet to transmit telephone calls
Widget - a window embedded in a website that allows you to view and manage data stored on another website.
WLAN (Wireless Local Area Network) - a wireless local computer network for communication between computers

Glossary definitions courtesy of the Wikipedia article of the same name

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JISC Newspaper Club lucid

Key

Each project in the Toolshed has a QR code. Smartphone users can scan the code and be taken directly to the project's website.

alpha **Alpha**: This technology is buggy, it provides a partial picture of what this tool will look like in the future but is just a glimpse, not the full version. Alpha tools are just starting to be tested. They can be trialled (and feedback from users is appreciated) but you will need some patience.

beta **Beta**: This technology has a bug every now and again, however it is getting very close to being 'launch' ready. You are welcome to trial a beta project in a user situation.

gamma **Gamma**: These projects have been trialled with real users and are ready to go. They will be soon be launched and made available to a wider audience for shared open source development.

techTools **TechTools**: the TechTools on each feature list the technologies used in that project. For more detailed technical information please see the project websites.

Project has produced technologies designed to be used in an internet browser

Project has produced technologies designed to be used on a mobile phone

Project has produced software or hardware

Project has produced tools to manipulate and explore data

Introducing the JISC Toolshed

The Toolshed is a showcase of some of the most exciting projects to come out of the JISC Rapid Innovation programme.

Rachel Bruce
Programme Director
Information Environment
JISC

The JISC Rapid Innovation (JISCRI) programme funded innovative, small-scale technology projects designed to engage with new and uproven technologies to create tools specifically geared to address the needs of people working in higher education. The projects took an iterative approach to development to ensure that user needs were met despite the short timescales. This publication showcases the tools that were developed, tools that have been designed for researchers, teachers, students, librarians and research managers.

Newsprint might seem an unusual medium for showcasing digital innovation projects. But we've chosen this format for the Toolshed because we want to reach a wider audience, and also make it easy for you to use. You might want to photocopy an interesting page for a colleague, for example, or circle some URLs to look up later. (Please feel free to reuse any of the content in this paper, as it is all freely available under a creative commons license.) We think the newsprint format highlights the fact that these are new and exciting projects, and in six months time these projects probably won't look like they do now. The tools may be adapted for different user groups, expanded to suit more situations, or they may have evolved into entirely different ideas.

The 12 prototypes featured here are a cross section of the 39 rapid innovation projects that were funded in 2009/10. There's an overview of all projects in the centrepages of the toolshed, and there is further information on all 39 projects on the JISC website: **http://bit.ly/jiscri**

Technology is shifting and evolving, and we need to ensure that the UK's higher education sector continues at the forefront of technology. Technology is now part and parcel of education and research, and we must anticipate and create the necessary changes in order to use it effectively. It's this kind of innovation that can enable learners to embrace non-traditional ways of learning and engaging with their studies; innovation that helps researchers disseminate and gather otherwise hidden data; and innovation that helps to create a smarter and leaner higher education sector.

The rapid innovation methodology allows us to work with new and unproven technologies to find the successes and failure more quickly and effectively then other methodologies would allow. It is essential for us to engage with new and unproven technologies because sooner or later one of these technologies will change the way we work. It also allows us to use existing technologies in new situations, and to ascertain whether they have the potential to improve practice. What the rapid innovation projects offer us are useful tools and important lessons to enable us to move forward in the application of technologies to education and research. A by-product of the projects is that they allow university staff to cut their teeth on new technologies and methodologies, and to share the knowledge they've gained with colleagues.

At the heart of all of JISC's work is a drive to maximise the benefits for the whole higher education sector, and naturally this extends to our work within innovation. This involves collaborating and sharing best practice, and some of the experience from rapid innovation projects will feed into guidance for the sector. JISC also encourages the use of open standards and open source in all projects to maximise the transferability of the project results.

The higher education sector has not escaped the general economic downturn, and we therefore need to ensure that JISC continues to invest in technologies that can benefit the sector in both in the short term and the longer term. Even in these difficult times we need to be thinking about innovating and planning for the long term to ensure we have a fit for purpose digital infrastructure. And rapid innovation helps us identify the winners we should back.

The projects featured in JISC Toolshed represent the cutting edge of technology innovation in higher education. All the projects are fully operational and in use, and we want you to try them out, learn from them, build on them. We'd love to hear your opinions or your ideas on how the projects could be improved.

You can contact JISC at **a.mcgregor@jisc.ac.uk** or **d.flanders@jisc.ac.uk.**

Two quotes from members of participating institutions can be seen at the top of the opposite page.

gamma

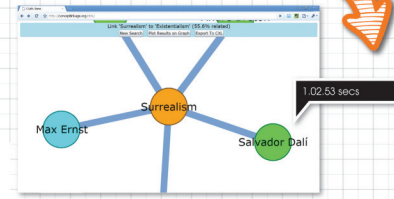
C-Link

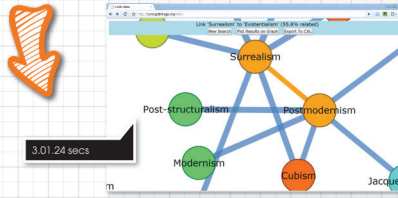
"the search engine for unexpected connections"

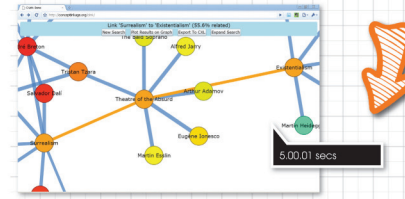
For when...
you don't know what you're searching for

You're a first year art history undergraduate. You need to write an essay on the impact of philosophy on art – looking specifically at surrealism and existentialism – but you just don't know where to start. You consider going to the library to look up books on surrealist artists in hope of stumbling upon something connected to philosophy, or going straight for the books on existentialism and in the hope of stumbling upon something connected to art, but you're dreading the prospect of starting such aimless research.

But as luck would have it you discover C-Link before you set off for the library. You open the website, type in 'surrealism' and 'existentialism', and then watch as the system springs into action, exploring and unfolding all the ways in which the two terms are connected. To your surprise, the strongest connection between the two terms is something you've never heard of before – The Theatre of the Absurd. 60 seconds spent on C-Link has saved you literally hours of frustrating browsing, and you now know a good place to start your library research.







C-Link (Concept Linkage in Knowledge Repositories) is a way to search when you don't know what you're searching for. Enter two items and colour-coded connections appear, tumble and twist, and then settle with the strongest link highlighted. It's mesmerising to watch, but this is more than just a pretty process: C-Link is a genuinely useful way to search around an unfamiliar topic and start gathering information in a semi-structured way.

Knowledge repositories are at the heart of almost all research and learning in university. But while they are an excellent resource, they are not always used effectively. New students in particular can feel overwhelmed by the sheer scale of the information they have access to – information they know is there but which they lack the information literacy to access. C-Link is simply a way to get started with relevant research. By entering two search items, students can see the different ways in which those items are connected on Wikipedia, and they can also see how all those other items are connected to one another.

C-Link has been tested with students at the University of Bradford - where it was developed - and even though the tests were fairly rigid scientific trials, some users have loved it so much they have carried on using the system. "The tests we've done have tended to be quite prescriptive," explains C-Link owner Peter Cowling. "We've told the users the sorts of things that we want them to search for. However, a significant proportion of the users have carried on using it – we know this as we capture usage statistics. Some of the users also told us that they find C-Link easier and more effective to use than conventional search teachniques. It's very encouraging."

C-Link's graphics are built with Silverlight, and the functionality is created from artificial intelligence algorithms. "Searching through large spaces such as Wikipedia and identifying the links between items is actually quite a difficult problem," says Peter. "We also have to have a way for a pair of pages to work out how closely they are related, so that's where we use an artificial intelligence approach. We also need to consider their 'cousin' relationships, not just the very close relationships – so we look at what concepts they're related to, which are related to other concepts, which are related to other concepts."

> **"Information searching is a fundamental skill for all students, and C-Link can make its teaching both more interesting and more challenging."**
>
> **Peter Hartley**
> Professor of Education Development, University of Bradford

Currently C-Link uses Wikipedia, but the system could be applied to any data repository. "We've had quite a bit of interest from users who want the C-Link treatment in their own data repository," says Peter. The next step for the C-Link team is to extend the system to a citation database of scientific papers, which would allow users to discover as yet unknown links between different papers. "We've also spoken about possible applications in architecture, or even the legal profession, where often you want to find a link between two legal cases," Peter adds. "We can imagine all sorts of different people using it."

HOW TO USE: C-Link
For more information about C-Link and to try the demo version go to http://bit.ly/clink-jisc

techTools
Java, WikipediaMiner, Silverlight

alpha

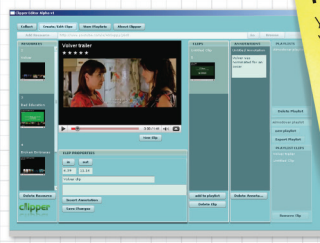
Clipper

"manage video clips"

techTools

Adobe Air, Flex and Flash, FLV, MOV, DCMI

You're a lecturer. You're planning a session on Spanish cinema, and you want your students to see and discuss some specific scenes in preparation for the seminar. You find the relevant film clips on YouTube and Vimeo, and add them to Clipper. You edit the video playlist order, and then add some notes using the annotation function, explaining to your students the key themes of the clips and inviting them to add their own comments. When you finish, you email your students the file and continue planning the session.



For when...
you need an easy way to compile and annotate video playlists

Clipper is a way to create audio/video playlists and add text notes, all without altering the original resource files. "Because Clipper is floating above the web 2.0 level you're just exchanging reference material and text," says Clipper owner John Casey. "Clipper doesn't actually host any of the videos, and that means that the files are small and lightweight, and can be easily exchanged via email."

"Typically the playlists you can create on YouTube, iTunes or Spotify are of whole resources," adds John.

"But Clipper allows you to collect clips from different sources. You're not a slave to monolithic playlists any more. You can also discriminate between different parts of the clip – you can identify them, tag them, create metadata and add notes. We haven't come across any other software or service that does this. There might be some, but we haven't seen them."

"People get really excited about the other possibilities for Clipper," says John. "Someone from the Open University thought it would make a great general purpose annotation tool. We think it's a great discussion tool and it could be really useful to embed in Virtual Learning Environments."

HOW TO USE: Clipper
Clipper is currently a prototype, but it is available to download from http://bit.ly/clipper-jisc

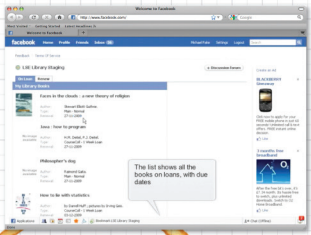
gamma

Library Widgets

"accessing library services from social networks"

For when...
you need to manage your library account outside of the library

You're a student, doing some work at 11pm. You're using some library books which are probably overdue, but the library is shut so you can't go to it or call them on the phone to be sure. Instead, you just go to Facebook and check the library application you added to your profile. Straight away you see that you have 6 books on loan, of which 2 are overdue and 4 need to be returned by Tuesday. You still need the books, so you renew them all directly through the Facebook widget.



techTools

Grails, DRY, Java, Spring, Hibernate, SiteMesh, jUni, log4j, ReST

Library Widgets is a straightforward tool. It's a way for London School of Economics (LSE) library users to see a list of what books they have on loan and their due dates, and renew them if necessary – all from the comfort of Facebook, Moodle, iGoogle or the Library Catalogue. Library Widgets is a convenient service for library users, but it's also great for libraries keen to widen access to their services and give users control of how and where they use the library.

The next step for the Library Widgets team is to expand the functionality of the widgets, primarily for the Moodle version of the widget. "At the moment it's quite stark, it's just a list of books," explains project leader Michael Fake. "We want to create a little dashboard with the information about people's accounts, so it's a little bit more user-friendly and has more detailed information."

The team also have plans to allow library users to pay fines through Library Widgets: "We have actually managed to make the widget do fine payments," says Michael. "But it isn't actually in production yet because although the middleware itself is capable of doing that, the other end of it is interacting with the finance systems at individual universities – and that's very local to whichever university you're at. We're still expanding the use of Library Widgets."

HOW TO USE: Library Widgets
Information about Library Widgets can be seen on http://bit.ly/lswt-jisc Please note that although middleware is freely available, Library Widgets is currently only available to use by students and staff of the London School of Economics (LSE).

alpha

Bayesian Feed Filter

"customised filtering for RSS feeds"

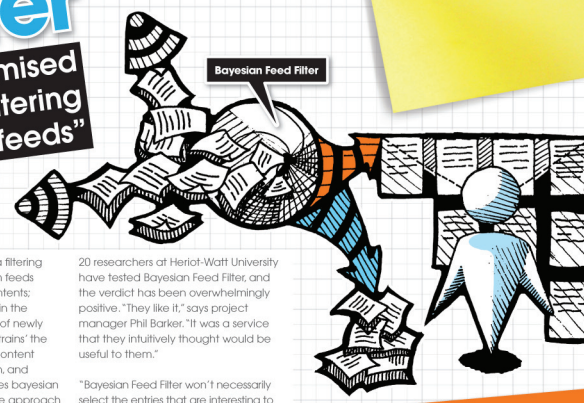
techTools

Suxor, RSS/Atom, OAuth

For when...
you're overwhelmed by irrelevant research papers

You're a postgraduate researcher. You're trying to research a specific topic and so you're subscribed to several journal RSS feeds, but it's a slow and frustrating process – for every one interesting paper you find, there are 20 or more that are irrelevant.

Bayesian Feed Filter fixes that problem by applying an automatic filter to RSS /Atom feeds that highlights the RSS items you are likely to be interested in.



Bayesian Feed Filter is a filtering tool for the RSS / Atom feeds of journal table of contents; feeds which typically contain the titles, authors and abstracts of newly published papers. The user 'trains' the software with examples of content that he or she is interested in, and Bayesian Feed Filter then uses bayesian statistical analysis – the same approach used in many spam filters – to predict how useful new RSS content is likely to be, based on the frequency of the identified keywords.

20 researchers at Heriot-Watt University have tested Bayesian Feed Filter, and the verdict has been overwhelmingly positive. "They like it," says project manager Phil Barker. "It was a service that they intuitively thought would be useful to them."

"Bayesian Feed Filter won't necessarily select the entries that are interesting to you," cautions Phil, "but it will select the things that are relevant to your interests. The more narrowly defined those interests are, the better the filter will work."

HOW TO USE: Bayesian Feed Filter
Bayesian Feed Filter is available from http://bit.ly/bayesfft-jisc Support and guidance is available from the Bayesian Feed Filter team, who can be contacted on http://www.icbl.hw.ac.uk/

alpha

Shuffl

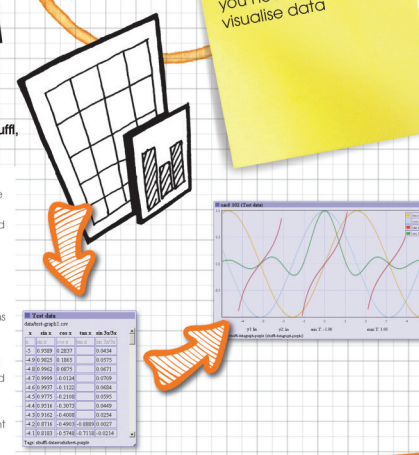
"hypercards on the web"

techTools

AtomPub, jQuery, Ajax, HTML

For when...
you need to visualise data

You're a biology PhD student investigating the classification of a particular strain of bacteria. You've collected a lot of data, which you manage and visualise using Shuffl, a data management tool which uses a record card metaphor as its user interface.



Shuffl is a way of managing web-based data using different types of coloured 'cards', to visualise data as graphs. Users can quickly load up spreadsheet data, select an area of the sheet and use that as the basis of creating a graph. There is a dynamic link created between the graph data and the table data, so if a new set of data is uploaded into that card, the graph linked to that data would also update.

Shuffl developer Graham Klyne has many plans for Shuffl, which he describes as "currently more of a technical foundation than an end-user product." For example, the next direction for Shuffl is a project with the University of Oxford Classics department. "I'd like to use Shuffl to do a side-by-side comparison of geographical distributions of the timeline distributions of different types of Greek vase," says Graham. "For example, one Shuffl card type could be used to construct a particular type of query. Another card type could be used to create a visualisation of the query results of the geographical distribution, and another card would do the same for the timeline. Then, through the drag and drop interface, you'd be able to connect the queries to the various forms of visualisation."

Ultimately, Graham says he'd like Shuffl to become a tool for manipulating and annotating Linked Data on the web. And while it's still some way from that end goal, Shuffl is still useful in its present form, as Graham explains: "When I showed our test user the graphing feature he said that was something he could really use. In fact, what he actually said 'I wish I'd had this last week when I was preparing a report!'"

HOW TO USE: Shuffl
Shuffl is not currently a finished application; however a working prototype can be accessed from http://bit.ly/shuffl-jisc

•)) Use the tag JISCRI in blog posts so that people searching for information about this topic can find what you're saying

beta

Portable VoWLAN

"the network in a bag"

For when...
you need a portable wireless computer network, no matter how remote your location

You're a geology student on a field trip. It's not practical for everyone to go climbing cliff faces to look at samples – you use a pair of walking sticks and a couple of other students don't have the physical strength or fitness levels – so one team stays at the camp and the other goes to the cliff, with both teams staying in touch via Portable VoWLAN.

You follow your colleagues' progress via a video camera carried by the tutor, and watch and listen as they stop and discuss an interesting section of rock. Using the VoIP phone system you ask them to take and send some digital photographs, which you then view on your laptop. You think some of the fine details in the photograph could be fossils, so you ask the tutor to check them. The tutor verifies your suggestion, and asks the group to date the fossils then suggest what their presence and position indicates for the geology of the area. As the fieldwork progresses along the coastline you work with your colleagues to build up a sense of how the area was formed and the events that have changed it.

Portable VoWLAN is a portable wireless local area network that allows researchers to exchange voice and video data in remote locations. All the kit is lightweight, robust and can work from battery power, making it ideal for fieldworkers.

Trevor Collins' team at the Open University have been creating portable networks since 2006, but Portable VoWLAN's big breakthrough has been in perfecting the quality of the audio connection. "Transmitting audio via a local area network is really difficult because it's time-critical," explains Trevor. "If there's a pause or delay while downloading a picture it doesn't matter, but if there's a pause in conversation it's a showstopper."

Talking over long distances during fieldwork is harder than you might expect. Mobile network coverage is often poor in remote areas, and walkie-talkies only work when there is a clear line of sight – if one person goes around a hill or into a valley the connection is broken. Voice over Internet Protocol (VoIP) as used in Portable VoWLAN is a more reliable way to communicate. It's also free, unlike mobile phone use, and it's easier to use than walkie-talkies, which require users to press or release buttons to talk. The VoIP server used by Portable VoWLAN is Asterisk, which Trevor describes as "a bit like Skype, but open source."

Portable VoWLAN's hardware includes everything a geology fieldworker might need to collect and transmit data: from digital cameras to netbooks, antennas to ethernet cables. The Portable VoWLAN toolkit is a creatively-compiled set of equipment, which prioritises durability and cost effectiveness. Power comes from lightweight laptop batteries, antennas are held by camera stands, and computers are solid-state netbooks that are more likely to withstand being dropped.

Trevor's team have put together a 'shopping list' to help others make their own portable networks (shown right). Out of this kit, which costs approximately £3,600, anyone could create a version of Portable VoWLAN capable of producing a 802.11g WiFi network, streaming video service and VoIP telephony server.

HOW TO USE: Portable VoWLAN
Go to the Portable VoWLAN blog http://bit.ly/vowlan-jisc for more information about creating a portable local area network.

techTools
Asterisk, Ubuntu, WDS, Mesh, MANET, PBX, SIP

Portable VoWLAN 'shopping list'

This is the equipment used by the Open University team in November 2009 to create their Portable VoWLAN toolkit. For full technical specifications and links to suppliers, please go to http://bit.ly/vowlan-jisc

Equipment type	Item	Approx Price (inc VAT)	Quantity	Total Cost
Power	External laptop battery	£85	6	£510
	Power over Ethernet (PoE) injector	£5	6	£30
Antenna	Senao EnGenius 8 dB Outdoor Omni Antenna 2.4 GHz	£20	2	£40
Stands	Compact photography light stands	£35	6	£210
Access point	Ubiquiti Bullet 2 HP 2.4GHz Access Point/CPE	£75	2	£150
	Ubiquiti Nanostation 2 (inc. PoE injector)	£70	4	£280
Ethernet switch	Netgear ProSafe 16 Port 10/100 Unmanaged Desktop Switch	£70	1	£70
Ethernet cable	Cat 5 Ethernet cabel	£45	1	£45
Ethernet connectors	RJ45 modular plugs and covers (packs of 100)	£25	1	£25
Netbooks	Asus Eee 901 PC	£250	3	£750
IP Camera	Edimax IC-3010WG Wireless IP Camera	£80	1	£80
Video encoder	AXIS Q7401 Video Encoder	£480	1	£480
Bullet camera	Waterproof Vari-focal Sony HQ1 Super EXVIEW CCD 580/550TVL	£180	1	£180
Digital Camera	Ricoh Caplio 500-SEW digital camera	£600	1	£600
GPS module	Nokia LD-3W Bluetooth GPS module	£25	1	£25
Rucksacks	Berghaus - Twenty Four Seven 25	£30	4	£120
Drybags	Exped Fold Drybag Bright	£4	6	£24
				Total : £3,619

beta

Walking Through Time

"Googlemaps for history"

For when... you want to experience historical maps

You're an architecture student. You're curious about how the urban landscape of your town has changed over time, so you open Walking Through Time on your smartphone. You start walking around the city, following a 150-year-old map. A main road marked on the map still exists, so you follow it, past a factory which is now some converted offices and a meadow which is now a shopping area. As you walk you listen to the audio commentary attached to the maps, and picture your ancestors walking the very same route.

Walking Through Time is a historical satnav; a DeLorean in your pocket; a history lesson under your feet. With Walking Through Time, the team from Edinburgh College of Art have combined Googlemaps and historical maps in a phone application. The result is an interactive historical map that you can use to move through time as well as space – to walk through a city as it was then, rather than as it is now.

"I had this personal epiphany when the iPhone first launched," explains Walking Through Time owner Dr. Chris Speed. "When the blue dot falls on the map I think something cognitively weird happens – suddenly you've put yourself in the map, rather than being on the outside looking at the map. And so we thought, well imagine if you could take all these old maps and walk through them in the same way, rather than keeping them in the classroom or in the geography lab."

Walking Through Time doesn't just make old maps portable by putting them on iPhones or Android phones, it also makes them participatory. The maps can be annotated, adding stories and colour to the spaces in order to become audio tours for tourists or history lessons for students.

"The idea is very much 'whose history is the right history'," says Chris. "The history of a street as explained by an eminent professor of history may be fascinating, but my own history – that perhaps this is where my gran used to walk to school – is equally valuable. The app could become a way of having a ground-up reflection of historical roots, of putting stories onto maps and tagging and sharing the experiences of the people who lived in these spaces."

The Walking Through Time application is currently available on 11 maps of Edinburgh, dating back to 1850. More widespread use is currently limited due to the licensing restrictions on the historical maps. But once the restrictions are lifted, Chris believes that it could become a very popular app. "It's probably going to be of more interest to the public than to historians," believes Chris. "Historians tend to want very specific data, but this is more suited to the general public who are curious to see what Plymouth looked like before it was bombed in the war, or Bristol in the Victorian era. Edinburgh hasn't had a massive amount of change, but even if you go to Edinburgh Park, some of the trees are older than the buildings. And because some of the mapping is beautifully old, it actually gives you the locations of trees – you can see that these trees have remained still as the urban developments around them have changed."

"When people try it out you can see that it takes a moment to click for them, the moment when they realise that they can move and the map moves with them," adds Chris "Then it comes alive. You really need that blue dot to fall with someone, and then they realise – 'oh I can't walk that way now,' and they flick between the hybrid and now, between the present and then, and after a while they find themselves walking through time."

HOW TO USE: Walking Through Time

Due to licensing restrictions, the Walking Through Time application is currently limited to Edinburgh maps, and it can only be used by UK HE institutions. To find out more about the application, please visit http://bit.ly/walkthrut-jisc If you are part of a HE institution and would like to use Walking Through Time, email the team on contact@walkingthroughtime.co.uk

techTools

Javascript GeoScript, GoogleMapsAPI

Contact a.mcgregor@jisc.ac.uk or d.flanders@jisc.ac.uk for further information on Rapid Innovation

alpha

Mobile Campus Assistant

"real-time campus information on a phone"

You're a student rushing to the library to finish an essay. You don't know when the next bus is, but luckily your phone can connect to the internet and you've bookmarked the page for Mobile Campus Assistant. A couple of clicks later you know there's a 12 minute wait for the next bus. But more importantly, you also see there's a new faculty library just round the corner, and it has 23 computers free. You abandon the original plan and head for the closer library.

Mobile Campus Assistant is a way for students to get real-time information while on campus. The system is currently set up as a mobile-friendly website so that anyone with a smartphone – any phone that has internet capability – can easily access it. Mobile Campus Assistant integrates data from around the University of Bristol campus, and it also pulls in some data from external websites, such as Bristol Transport.

"We've come across loads more stuff that would be handy to put in there," says project leader Nikki Rogers. "Things like student timetabling information, opening hours of campus facilities or bike lock up information. A hookup to the library would also be handy, so that students can see if books they've reserved are actually on the shelf or not before they come into the campus."

"It's quite innovative," adds Nikki. "Hardly any universities are doing this sort of thing. The University of Oxford are doing something similar, but they're the only university that we're aware of that are doing a combined semantic web and mobile technology approach. People definitely like it. The feedback we get is really positive, and any criticism is only ever on usability issues – things like 'it takes too many clicks to get to the news'. As a service, people really love it."

HOW TO USE: Mobile campus assistant
Mobile Campus Assistant can be accessed from http://bit.ly/mca-jisc, but please note it is currently a demonstrator, not a fully supported service.

techTools
Java, Jena Semantic Framework, RDF, SPARQL, Jersey, Quartz, jQuery, Geolocation API, Freemarker

For when...
you need to stay connected with the university

alpha

CloudBank

"a web 2.0 vocabulary book"

techTools
Android, Java, PHP

For when...
you want to improve how you learn new words

You're an international student at a British university. Your English is pretty good, but you're still coming across words and phrases you don't understand, like 'bonkers' 'chew the fat' or 'red tops'. You find it useful to write down these new words in a vocabulary book, but it's inconvenient to carry a book around. So instead, you type words straight into CloudBank.

We know that people studying languages like to keep vocabulary books," says project manager Lyn Pemberton. "But it's very much an 'of the time' thing – when you notice something you need to write it down then and there. If you can't do it immediately you miss opportunities to learn." CloudBank avoids that problem by turning students' phones into mobile vocabulary books.

Any new words – whether heard in a conversation or on the television – can be immediately entered into the mobile phone. This user-generated data is stored on a central database using cloud computing, and that central word bank can then be accessed by anyone. Students can type words and definitions, they can take photographs with their phones to help explain the concept, and they can even add sound files using the recording function.

"CloudBank gives users a convenient tool with which to construct their own reality; negotiating meaning, and sharing and discovering the world as content."
Tom Ottway, Head of English
International Study Centre, University of Sussex

"CloudBank is good for independent, autonomous learners," says Lyn. "It would suit someone who is good enough to not go to language classes anymore, or perhaps someone who's left university. It's a good way for learners to organise their learning themselves, and learn from each other."

HOW TO USE: CloudBank
To install CloudBank onto an Android phone go to http://bit.ly/cloudbank and follow the instructions. Non-Android users can view the website at itrg.brighton.ac.uk/cloudbank

alpha

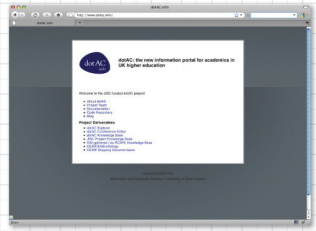
dotAC

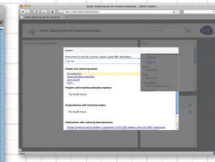
"a tool for exploring the HE research landscape"

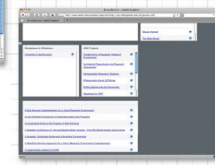
HOW TO USE: dotAC
Go to http://bit.ly/dotac-jisc

For when...
you want to uncover research networks

You're a researcher trying to put together a consortium for a large project. This is an interdisciplinary project and you don't know many people in the other disciplines, so you go to dotAC and search for one person you do know. The system brings up her profile, which includes what she's worked on, and who she's worked with. You start looking at all the networks around that person, and spot a research project that is close to what you want to do. There are five other people connected to that project, so you bring up their profiles and start contacting them.







"HEFCE collects a huge amount of research data," says dotAC owner Nick Gibbins, pointing to the RAE exercises and the upcoming Research Excellence Framework. "For each of these we've noticed that there is a tremendous burden placed on university administrators to gather all this data. We as researchers never get to see all the data. So we thought it would be really useful if we could create a way to see the global picture of the research landscape in UK higher education, and also see some of the community behind it."

The next big development for dotAC involves encouraging repositories to publish natively Linked Data. "We're very big on Linked Data," says Nick. "We have a Linked Data export of metadata from EPrints 3. This is a piece of code that's now gone into the EPrints 3 codebase, so in the next data revision it'll get published. And when that gets picked up by repositories all around the UK we'll get them publishing natively Linked Data which we can then pick up."

Another potential avenue for dotAC involves investigating how to use the Common European Research Information Format (CERIF), a European standard for research information. "Lots of people are looking at CERIF, but nobody so far has committed to using it," says Nick. "We've already got some work in place which we could use to generate a mapping tool. If we could do that, we could get data into our systems faster and create a more current view."

techTools

Linkeddata, CERIF-XML, FOAF, BIBO, DC, RDF, SPARQL, OWL, XSLT, ePrints3

alpha

Writeslike.us

"match.com for researchers"

For when...
you want to discover unknown academics

techTools

Python, Perl, OAI-PMH, ReST, NLTK, CPAN

You're a postgraduate student starting work on your thesis. You're nervous about approaching some of the big-name people in the field, and in any case you'd prefer to find relevant people who are local to you. So instead of scouring bibliographies for academics to work with, you head to www.writeslike.us and start a search using key words from your research topic. The search results bring up ten academics in your area, who you can now examine in more detail to decide who you'd like to approach.

The more prominent an academic is in their field, the higher the chances that they will be cited by other people in papers and journals. And the more citations they have, the more prominent they become. Less well-known academics are less likely to be cited by others, but that doesn't mean that they don't still do good research, or produce interesting work. Writeslike.us tries to increase the visibility of less prominent academics and make it easier to discover and access unknown researchers.

"The idea behind Writeslike.us was to look at how to manage informal scientific collaborations – getting people to talk together and getting ideas out," says Writeslike.us project manager Emma Tonkin. Writeslike.us can be used to search for names of academics, subject areas, and paper titles. Once you have results you can find out which institutions people are linked to, and from there get a geographical idea of where people are based.

Emma has high hopes that Writeslike.us could become a genuinely useful tool to access repository data. "I think it's something that produces interesting results, and it's something that we could really practically place into an institutional context," she says. "One of the difficulties is that people tend to find their papers in repositories with Google, and then they immediately leave. What we want to do is get some interconnectivity going on, to get people interested in what's being done at a university and encourage them to look in more detail at what else is there. I think we have something that could do that."

HOW TO USE: Writeslike.us
Writeslike.us is available to use at http://bit.ly/writeslikeus

•)) **20 second video introductions to most projects featured in the Toolshed can be found at http://blog.iedemonstrator.org/tag/jiscri/**

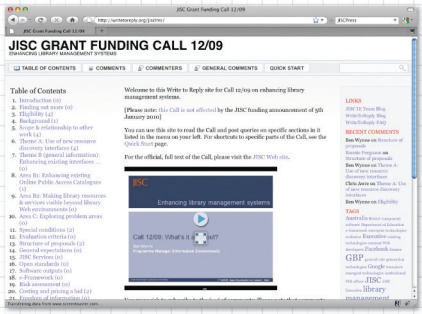
JISCPress

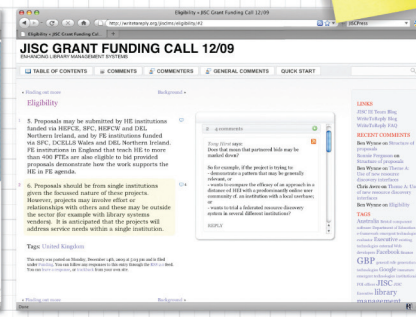
"a platform for publishing and discussing documents"

techTools

Wordpress, PHP, RSS/ATOM

For when...
you want to comment on every section of a document





You're a researcher in a university, working on a project you think might be eligible for funding. A colleague tells you that JISC has put out a funding call on JISCPress, so you go to the JISCPress website.

You see JISC's latest funding call document and start reading it, but there are some parts you don't understand, and other parts that you have questions about. Then you realise that each paragraph of the document has a commenting facility. Reading the comments, you see that your question has already been raised and then answered by JISC staff. Reading on, you see other comments raising issues you hadn't even considered. You leave a comment yourself, and then carry on reading. JISCPress has enabled you to better understand the document, while also giving JISC instant feedback on its funding call.

"The New York Public Library is launching an ambitious public reading experiment to celebrate the 250th anniversary of Voltaire's Candide. digress.it will be powering a full networked edition of the text in which commissioned readers and the public are invited to comment in the margins of the text: the centuries-old practice of margin annotation plugged into the social architecture of the web! We're so excited to have a tool that allows us to explore new roles for the Library in the information landscape of the 21st century."

Ben Vershbow
Institute for the Future of the Book

JISCPress is a way for JISC to publish documents as open formats on the web. Instead of sending out Word and PDF files to be downloaded to desktops and passively read, JISC can instead make the documents available in a way that invites comment and collaboration. People can leave comments at the paragraph level – they can ask questions, add insights, give critiques, and respond to other people's comments.

"It's useful for whenever you've got a document you want comment on," says project manager Joss Winn. "We use it as the University of Lincoln for faculty strategic documents, to manage consultations amongst colleagues. You don't just have to use it with draft documents, but it makes more sense to use a document in the draft or consultation process, because the idea is that you use the comment feedback to make a better document."

The possible uses for JISCPress aren't confined to gathering feedback, adds Joss: "We propose that JISCPress could be used as a document store. It could be an online store for project research output where we can show relationships between the calls, the bids and the final reports, all on the same JISCPress platform."

JISCPress emerged out of a similar project, called WriteToReply. WriteToReply, which was also created by Joss' team, started as a way of enabling detailed response to the Government report 'Digital Britain'. Feedback on WriteToReply was positive, and so the team started making more documents written for public review available online.

However, when it came to creating a version of WriteToReply specifically for JISC, the team discovered that the core technology wasn't up to scratch. "WriteToReply used a plugin called CommentPress, but it was old and had reached its limits in terms of what we wanted to do with it," says Joss. "So part of the funding for JISCPress went on completely rewriting this core technology. We asked the original CommentPress developer to join our project team and together we created a new plugin, called digress.it."

The JISCPress platform is built on blogging software Wordpress, and digress.it is an open source Wordpress plugin. Joss estimates that about 90% of JISCPress is created from existing open source code, and he has no doubts about the benefits of using Wordpress to create JISCPress. "We don't need to build the community from scratch – it's already there with Wordpress," he says. "We can use that existing knowledge, and we can also release our plugins back into the Wordpress community – we want to show the value of this project."

digress.it is now an open source plugin, and it's captured the imagination of a wide range of different users – it's even being used by some English literature students to discuss particular sections of texts. For Joss there's one unexpected outcome that he's particularly proud of: digress.it is being used by the White House. "The White House, in collaboration with New York's Cornell University is using digress.it to get public feedback on draft Government legislation, on a website called Regulations.gov, " he says. "It just shows how much potential there is for this!" "digress.it is really easy to set up, and we hope this will encourage a wide variety of people to use it," adds Joss. "We're really looking forward to seeing what other interesting things people could do with it."

"Just finished beta testing my new course site using the digress.it plugin to display ancient texts for commenting. Worked beautifully to engage students with texts, and one another."

Andrew Lynch
University of Exeter, UK

JISC wants to engage in an open dialogue about how we can best support the higher education sector. In writing our new Strategy 2010-12, we were delighted to be able to use JISCPress to support this open dialogue. JISCPress provided a forum for a completely open, active and interactive conversation to take place and many of the comments that were made were incorporated into the new strategy launched in December 2009.

Sarah Porter
Head of Innovation, JISC

HOW TO USE: JISCpress
You can see JISCPress in action at jiscpress.org and if you want to set up your own site go to http://bit.ly/jiscpress

The JISC Rapid Innovation programme

Details of all 39 projects in the programme and the people who were responsible for them

AMSeT
Andrew Booth and team
University of Leeds
Creating template teaching/learning workflows atop Alfresco CMS using BPML
http://bit.ly/amset-jiscri

archivePress
Richard Davis and Rory McNicholl
University of London Computing Centre
A blog preservation tool.
http://bit.ly/archivepress

Bibliosight
Nick Sheppard and team
Leeds Metropolitan University
An application integrating the Web of Science web-services API with the institutional repository.
http://bit.ly/bibliosight

Artnotes
Dave Hagan, Kirk Barron, Owen Watson
University of Bolton
An iPhone application aimed at students in fine art, photography and other visually orientated disciplines
http://bit.ly/artnotes

CLASM
Richard Davis and team
University of London Computing Centre
A moodle plugin for depositing/displaying CLA content in repositories
http://bit.ly/clasm

BayesFF
Lisa Rogers, Phil Barker, Santy Chumbe
Heriot-Watt University
Finding and promoting relevant items for researchers from RSS feeds
http://bit.ly/bayesff

Clipper
Tom MacMaster and team
Carnegie College
Picasa for video.
http://bit.ly/clipper-jiscri

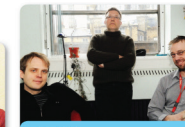
C-Link
Peter Cowling and Stephen Remde
University of Bradford
A way of browsing wikipedia to enable linking between related concepts.
http://bit.ly/clink-jiscri

CloudBank
Marcus Winter, Lyn Pemberton and Sanaz Fallahkhair
University of Brighton
Cloudbank is a crowd-sourced vocabulary tool for advanced language learning.
http://bit.ly/cloudbank

Diaser
Damian Brasher and team
University of Southampton
Simple to use redundancy software for open source servers
http://bit.ly/diaser

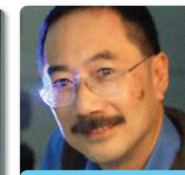
dotAC
Nick Gibbins and team
University of Southampton
A Semantic Web tool for exploring the state of the research landscape in the UK's Higher Education domain.
http://bit.ly/dotac-jiscri

EP2DC
Kenji Takeda and team
University of Southampton
A module for eprints repository software that supports the submission of xml formatted data with the associated manuscript.
http://bit.ly/ep2dc-jiscri



FReSH
Tobias Blanke, Mark Hedges and Richard Palmer
King's College London
Lightweight interface for using high throughput computing to analyse humanities documents
http://bit.ly/fresh-jiscri

ICEiFace
Tim Cappelli and team
University of Manchester
An interface to explore and interrogate complex, ontology based datasets using the medical curriculum.
http://bit.ly/iceiface

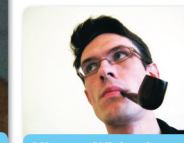


INVISQUE
William Wong and team
Middlesex University
Interface for searching library resources, will seek to represent relationships between various resources to help people searching for information.
http://bit.ly/invisque

JISCPress
Joss Winn and team
University of Lincoln
A demonstrator prototype publishing platform for discussing documents
http://bit.ly/jiscpress

JISCWILD
Darren Mundy, Darren Stephens, Keith Dykes
University of Hull
Powerpoint plugin to enable real time interaction & manipulation of slide content during a lecture.
http://bit.ly/jiscwild

JournalToCsAPI
Roger Rist, Lisa Rogers and Santy Chumbe
Heriot-Watt University
An API to enable repository managers and librarians to embed information about the contents of journals in their services.
http://bit.ly/journaltocs



Library Widgets
Michael Fake (pictured) and Shiraz Azizali
London School of Economics
Renew books and access core library services from Moodle, Facebook, and iGoogle
http://bit.ly/libwidgets

LIST8D
Michael Wilcox and team
University of Kent
A Web 2.0 mashup approach to creating and consuming university reading lists.
http://bit.ly/list8d

markr
Dan Dixon and Prakash Chatterjee
University of Western England
A specialised server-based feed reader intended help educators review and mark student blogs
http://bit.ly/markr

Mobile Campus Assistant
Nikki Rogers, Mike Jones and Chris Bailey
University of Bristol
The creation of a smart phone website and application to provide students with location and time sensitive information.
http://bit.ly/mcabristol

MEPRINTS
Marcus Ramsden, Patrick McSweeney and Sebastien Francois
University of southampton
A user profile plugin for ePrints repository software
http://bit.ly/meprints

Microviews
David Millard and team
University of Southampton
Enhancing eprints repository software to display a summary view of a repository object when hovering over an eprints link.
http://bit.ly/microviews

Mobile detective
Andy Priest and team
University of Manchester
A mobile friendly version of the popular Intute Internet Detective tutorial.
http://bit.ly/internetdetective

Open psi
John Darlington and team
University of Southampton
A semantic Information Service stimulating interaction between Researchers, Public Sector publishers, and information mashup creators.
http://bit.ly/openpsi

PAXS
mc schraefel, Daniel Alexander Smith and Joe Lambert
University of Southampton
Creating advanced search and metadata extraction plugins for eprints repository software
http://bit.ly/paxsri

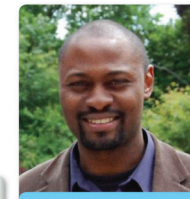
PICT
Rory McNicholl and team
University of London Computing Centre
Collecting of comments on items in institutional repositories centrally as well as locally.
http://bit.ly/pict-jiscri

RapidSeis
Jano van Hemert and team
National E-Science Centre
A community gateway to analyse seismology data using the revolutionary Rapid portal technology.
http://bit.ly/rapidseis

Rudiment
Samia Oussena and Anna Kocurova
Thames Valley University
A secure collaborative document creation and management social network
http://bit.ly/rudiment-jiscri

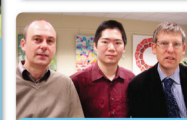
Scrutiny
Tim Hitchcock, Marta Ibarra, Michael Pidd
University of Hertfordshire
A firefox plugin that recognises items of interest on web pages. Learns as well as having interests registered at start
http://bit.ly/scrutiny-jiscri

Shuffl
Graham Klyne and team
University of Oxford
A tool to help with the creation organisation and annotation of data using record cards (post-it notes) as a metaphor.
http://bit.ly/shuffl



SPACER
Gobe Hobona and team
University of Nottingham
A mobile application for to query repositories offering metadata through geospatial standards.
http://bit.ly/spacer-jiscri

SUBSIFT
Simon Price (pictured) and Nikki Rogers
University of Bristol
Matching submitted conference/journal papers to potential peer reviewers based on similarity to published works.
http://bit.ly/subsift



Visual History
Michael Cottam, Dongjie Xu and Philip Holifiel
University of Central Lancashire
A visualisation system for undergraduate history projects.
http://bit.ly/vishistory

XPERT
Andy Beggan and team
University of Nottingham
Auto create rss feeds out of learning resources for consumption by central rss aggregation service
http://bit.ly/xpert-jiscr

VoWLAN
Trevor Collins and team
Open University
A portable wireless local area network for learning/research taking place in remote areas.
http://bit.ly/vowlan

Walking Through Time
Chris Speed and team
University of Edinburgh
SatNav for historical maps.
http://bit.ly/walkthrut-jisc

WritesLikesUs
Emma Tonkin, Alexey Strelnikov and team
UKOLN
Explores generation of metadata about individuals and their likely community memberships.
http://bit.ly/writeslikeus

Why rapid innovation

Each of the rapid innovation projects featured in this JISC Toolshed has been built for a specific type of user in a university in a short timescale, funded by a limited budget of between £15k and £40k. It's an efficient and relatively inexpensive testing ground for new technology.

These projects are experimental. They are testing the range and scope of new technologies, and not all of them will succeed. Some Rapid innovation projects will uncover fantastic new ways of using technology, and even unsuccessful projects are valuable as they provide useful lessons that can be built on. Rapid innovation is a fast and cost-effective tool to filter new technologies that could be relevant to education and research, in order to find those that deserve further investigation and implementation.

The JISC Rapid Innovation (JISCRI) programme helps to kick-start the process, guide the projects as they develop, and communicate their progress to the rest of the sector. As the central point of contact for all projects, JISC's role is to see which projects are working well, and to share the successes and failures. This supports learning across the sector and helps avoid any possible duplication of effort, and it also encourages knowledge sharing between project teams.

Central to the success of the rapid innovation model is the idea that constraints can be liberating. Because of the strict limits on their resources, developers find themselves adapting and building on existing technology and ideas, instead of feeling obliged to reinvent the wheel with each new functionality. After all, two or three developers working for just a few months don't have time to consider every type of user and every possible user situation.

Ultimately, rapid innovation is just one of many techniques used by JISC to guide the direction of technology use in higher education. A rapid innovation project may be picked up and tested by a university, and become a pathfinder project. Another university may be impressed by that, and turn it into an implementation project in order to embed the technology in the university. From there it might become a best practice model, or it might become part of a top-level project reviewing how the university's systems best work together. Rapid innovation is just a tool used by JISC to address unproven technologies. Once those technologies have been proven by a rapid innovation project, they're then ready to be picked up by any of the other innovation techniques.

JISC has a responsibility to do everything it can to maximise the benefits of innovation for universities. Unproven technologies can't be used immediately with large-scale embedding or pathfinder projects – the risk of failure is too great. But by testing the technologies on a small scale and in a controlled environment, we can quickly assess which technologies are likely to deliver real benefits to larger projects which will deliver real benefits to the universities themselves.

We're not claiming that the fundamental ideas behind the JISC Rapid Innovation programme are new; the many successful technology companies that come out of silicon valley often use this kind of methodology when starting out, and JISC has used it before for projects such as SWORD (Simple Web-service Offering Repository Deposit – see box right).

There are many different routes a rapid innovation project can take once it has finished. Some successful rapid innovation projects may become embedded in universities as they are; others may continue to be developed by open source communities or in a higher education institution. There may be commercial opportunities where companies decide to build on the development work done by these projects.

So far we've found that this approach to technology innovation is a successful way to develop useful tools and skills and to identify new opportunites and directions.

SWORD: A RAPID INNOVATION SUCCESS STORY

SWORD (Simple Web-service Offering Repository Deposit) was a JISC-funded rapid innovation project from 2006/07. The SWORD protocol simplifies the process of depositing content into repositories, making it easier for people working within education and research to distribute and store information. SWORD came out of a need for a standardised tool for depositing content, which would allow similar functionality across sites and repositories. It satisfied that user need, and satisfied it well – it's now used by all the major suppliers of repository software, including ePrints, DSpace and Microsoft Research (the centre for Computer technology research at Microsoft Corporation.)

SWORD began with an initial investment from JISC of £30,000. This relatively small amount of funding was all it took to create something desperately needed by people working with repositories. SWORD generated widespread excitement, but critically it was also immediately picked up and used by the people it was made for – because not only was it a good idea, it was also custom-made for those users. By embedding themselves in the community, the developers understood exactly what was needed from SWORD.

As a rapid innovation project, SWORD had strict constraints on what it could do and who it was being created for. The initial project stripped away complications that a larger project would have to take into account, and the end result was a smart system that worked exceptionally well in a very narrowly defined field, for narrowly defined users. The constraints of rapid innovation also helped guide which technology SWORD should be built on – the SWORD developers decided to use RSS/Atom, an existing technology that was already perfectly suited for SWORD.

Three years on and SWORD is now accepted as an important part of the future of repositories. It has continued to evolve and is now well placed to consider some of the wider issues and user groups which were out of scope for the initial rapid innovation project. But thanks to the way it was initially developed as a rapid innovation project, SWORD succeeds because it is a clearly defined tool, created for a clearly defined set of users.