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Project Director	Susan Ashworth, Assistant Director (Research and Teaching), University of Glasgow		
Project Manager & contact details	William J Nixon Email: w.j.nixon@lib.gla.ac.uk Address: University of Glasgow Library Hillhead Street Glasgow G12 8QE Tel: 0141 330 6721 Fax: 0141 330 4855		
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Project Team

Susan Ashworth, Project Director (Library)
William J Nixon, Project Manager (Library)
Valerie McCutcheon, Project Manager (Research & Enterprise)
David Anderson, Technical Specialist (IT Services)
Lesley Drysdale, Technical Specialist (IT Services)
Gordon Allan, Database Manager (Research and Enterprise)
Marie Cairney, Enlighten (Library)

Key Assistance

In addition to the core project team the project received key assistance from:
Jim Beck, Management Information Services
David Gibson, Corporate Communications
Stephen Beaton, Medical Faculty

Project Board

Dr James Currall, IT Services
Prof R Ó Maolalaigh, Department of Celtic and Gaelic

Executive Summary

The *Enrich* project was a 12 month JISC project funded as part of the Inf11 Programme (2009-11)¹. It was conducted in partnership by the Library, Research and Enterprise and IT Services – with additional technical support from EPrints Services. This inter-departmental approach was critical to the success of the project and the repository's long term sustainability as an institutional [not simply Library] service.

At its heart, *Enrich* provided a clear focus for the integration and enhancement of the University of Glasgow's repository, Enlighten with other institutional systems, including our Research System (for funder data) and our Data Vault (for staff records), lowering barriers to deposit and increasing the range of information held.

Key deliverables

- Over 11,000 local user records added and institutional login enabled
- Links between the repository and the Research System (RS) to enable funding data from the RS to be easily added to the repository.
- The implementation of a comprehensive repository and publications database with over 23,500 records publicly available
- Range of value added services including a Glasgow authors browse view, OpenURL resolver links and statistics which enhance access to the records and the full text.

Key objectives:

- Establish Enlighten as a comprehensive University-wide repository and central publications database
- Create staff profiles using data from core institutional systems including the publications lists from the repository and project information from the Research System
- Ensure compliance with funders' open access grant and award policies by using the Research System to identify projects nearing completion and providing alerts to remind researchers of their publishing obligations
- Improve publicity for research activity and outputs

Implementation

The planning and implementation of the project was focussed around three distinct but inter-related sets of data:

- REF pilot publications data - Excel spreadsheets arranged by Units of Assessment
- Staff data - held in the University's Data Vault
- Project/funder data – held in our Research System

We worked with this data to ensure that Enlighten became connected to, and integrated with core institutional systems like the Research System and our Data Vault. This work was split between EPrints Services and IT specialists in our IT Services department.

¹ JISC Inf11 Programme, <http://www.jisc.ac.uk/whatwedo/programmes/inf11.aspx>

Conclusions

The *Enrich* project has enabled us to deliver a mature and sustainable repository which is clearly integrated with institutional authentication systems and funder data. And one, which in its own right can provide data to populate staff profiles or provide links to associated publications from the Research System.

This work has enabled the University to better fulfil its Publications Policy by increasing the rate of content deposited and by integrating two key collections of data, staff data and funder data into Enlighten.

Over the duration of the project interest in the convergence and relationships between repositories and research systems has grown considerably. We have already widely disseminated to the research and repository communities, with further presentations to follow including ARMA and EuroCRIS.

We believe that we can also be seen as an institutional exemplar for the benefits of integration between research systems and a repository, particularly in the areas of:

- People (Relationships)
- Processes
- Policies

The *Enrich* project has demonstrated that partnership between the University Library, and the Research Office, in conjunction with researchers, administrators and IT Services is critical to ensuring that the repository is effectively embedded as part of the research management lifecycle rather than a separate and disconnected activity.

It also demonstrates that a successful repository is not just about technology but about the shared vision and work of stakeholders across the institution. Unless the needs of the key stakeholders (including academic staff as well as administrators) are addressed and they are provided with services which support their existing work and research reporting needs then the repository will remain an orphaned and disconnected service.

1. Background

The University of Glasgow has a mature and well established institutional repository service, Enlighten and has been at the forefront of sustained work with institutional repositories in the United Kingdom since 2001. The development and origins of Enlighten can be found in the JISC funded DAEDALUS project in 2002, as part of the FAIR Programme. This project ended in August 2005 and the project made the transition to a full service in April 2006.

In June 2008 the University Senate approved a publications policy requiring staff to deposit published and peer-reviewed journal articles, as well as content into Enlighten. A policy, itself is not however a “magic bullet” and it must be supported by a range of advocacy and service development activities which will enable it to become a reality

The University of Glasgow has made significant investments in the repository on an ongoing basis. This has included key support at Vice-Principal (Research & Enterprise) level as well as additional funding for library staff to work with the repository.

We identified “technical” and “process” gaps in our repository service which, if addressed would greatly assist the support and adoption of the University’s publications policy. *Enrich* provided us with the opportunity to “mainstream” the repository by:

- Ensuring the repository was as comprehensive as possible through a programme of bulk importing, starting with REF Pilot publications
- Lowering the barriers to full text deposit by implementing login by institutional credentials
- Enabling import tools (like DOI) to reduce keystrokes
- Addressing local publication needs and procedures with a mix of deposit models
- Linking to funder data to demonstrate compliance to funding bodies
- Surfacing publication data from the repository in staff A to Z profile pages

1.1 RAE and the REF Pilot

The University Library worked closely with academic colleagues and our Research and Enterprise department during the Research Assessment Exercise (RAE 2008) and this continued with our participation in the REF Bibliometrics Pilot Exercise. This collaborative work has strengthened relationships between the Library’s repository managers and the University academic community and provides a firm foundation for future repository development. The importance of these relationships to the effective delivery and realisation of Enlighten’s full potential cannot, we feel, be underestimated and are critical to our future success. Enlighten is now regarded as a central and essential University system and will act as the University’s publications database.

1.2 Repository, Publications Policy and Research System

Enlighten is a “hybrid” repository and includes a mix of both full text and solely bibliographic records. At the beginning of the Enrich project, April 2009 there were some 4,500 records in the service, by the end of March 2010 that had risen to 23,500 with an additional tranche of 5000+ records to be added in April 2010.

The University’s Publications policy was approved by Senate in June 2008 and has two key objectives:

- To increase the visibility of research publications produced by staff employed by or associated with the University of Glasgow
- To ensure that research outputs are prepared and curated in a way which helps maximise the value that they have for the university in terms of the external use of bibliometric data e.g. league tables, post-2008 RAE

The Research System Development Project (RSDP) undertaken at Glasgow delivered significant enhancements to the research process. The project ended in March 2008 however we have continued to deliver further enhancements as prioritised by the User Group. The University has had a data rich system for many years. A more user friendly web front end was introduced in May 2006 and in June 2007 we released a further version with a fully integrated costing tool. We believe this to be the first in the UK to have this level of integration and functionality. The Research System has automated links to the Human Resources, Finance, and Student Records Systems and work is ongoing to make the system available to a wider user community and to link to further University of Glasgow systems such as Enlighten.

2. Aims and Objectives

2.1 Aim

The overall aim of the *Enrich* project remained unchanged during the course of the project and was “to improve the integration of Enlighten, the University of Glasgow’s institutional repository service with the institution’s Research System.”

This aim was driven by our recognition that the repository cannot play the range of roles expected by its users and its institution if it continues to exist as a separate and disconnected data silo.

We also recognised that if work is to be effective and sustainable it must be done in partnership with academic and service departments.

2.2 Objectives

The project’s key objectives were to:

- Establish Enlighten as a comprehensive University-wide repository which will also act as a central publications database (going back to 2001)
- Enhance the usability of Enlighten for depositors through linkage to the University’s Research System by increasing the rate of deposit and the use of a single sign-on login
- Enhance the usability of Enlighten for administrators with tools which will enable them to effectively manage the deposit of content into the repository and identify any gaps in coverage or missing publications to provide comprehensive coverage
- Develop clear policies and workflows with academic departments and Faculties to ensure a sustainable and ongoing flow of content into the repository
- Create staff profiles using data from core institutional systems including the publications lists from the repository, project information from the Research System and Human Resources data.
- Ensure compliance with funders’ open access grant and award policies by using the Research System to identify projects nearing completion and by providing alerts to remind researchers of their publishing obligations

- Improve publicity for, and dissemination of, research activity and outputs
- Deliver an agreed institutional preservation policy, which will be formulated in discussion with IRIScotland and the National Library of Scotland

The project met and achieved its core integration objectives working, in particular with funder, staff and REF bibliographic data.

During the course of the project however the Library did not purchase the harvester product from Innovative Interfaces Inc (III). It was intended that this would have enhanced access to records from Enlighten by making them available through the library's "vertical" search tool, Encore.

3. Methodology

The project's overall methodology was, like the DAEDALUS² project before it, a twin track one of Service Development and Advocacy. We recognised the success of this approach and the scope it provided to balance technical issues with those of copyright and advocacy.

The work was conducted in partnership by a core team drawn from the Library, IT Services and Research & Enterprise. This team was supplemented by colleagues in academic departments, and other central services include Corporate Communications and Management Information Services.

3.1 Work-packages

The project was managed through a series of 5 interconnected work-packages:

1. Enhancing Accessibility of the Repository and Associated Outputs
2. Enhancing the Repository Deposit Experience
3. Generating Staff Profiles
4. Integrating the Research System with the Repository
5. Managing the Repository as part of the Research Information Lifecycle

These aligned with the aims of the Inf11 Programme.

Details on the deliverables of these work-packages are covered in section 4, Implementation.

3.2 Critical success factors

The project's methodology identified the following critical factors:

- Engagement with academic staff
- Appropriate technical support and resources
- Copyright clearance for full text material
- Clear and effective workflows with departments
- Library staffing resources available to manage throughput of deposits
- Liaison and co-ordination of activities with Research and Enterprise

² DAEDALUS project, <http://www.gla.ac.uk/daedalus>

3.2.1 Engagement with academic staff

This was ongoing throughout the project and built on the work the Library had undertaken both with the RAE and the REF Pilot. Staff in the Library continued to meet with Heads of Department and to attend departmental meetings to demonstrate ongoing developments with the repository. The project team ran various workshops and provided documentation and support on the deposit of material into the repository for University staff.

3.2.2 Appropriate technical support and resources

The development work was done through a mix of local technical staff and consultancy work done by EPrints Services. We found that this approach was a good fit which enabled us to take advantage of our local systems knowledge which we partnered EPrints Services. EPrints Services provided high quality tailored solutions for our needs through their in-depth knowledge of EPrints itself and their experience of work done elsewhere.

3.2.3 Copyright clearance for full text material

Procedures for this work are in place with our Enlighten team who check the copyright for material deposited into the system. A key element of our Publications Policy is that we would not ask staff to contravene copyright.

3.2.4 Clear and effective workflows with departments

The library has worked closely with the University community in establishing not only clear and effective workflows for deposit but also like many other institutions we have adopted a range of deposit models:

- Mediated deposit: departments continue to maintain a local publications database and send regular imports. Full text will be sent directly by staff to a dedicated e-mail address (deposit@lib.gla.ac.uk)
- Proxy deposit: a member of administrative staff will carry out deposit of bibliographic details and full text directly into Enlighten on behalf of academic staff (academics will need to send full text to the nominated member of admin staff)
- Self-deposit: individual members of academic staff will deposit data and full text directly into Enlighten

3.2.5 Library staffing resources available to manage throughout of deposits

The University and Library continue to provide support for the repository and it is recognised as a key strategic aim. The library's Enlighten staff deal with the gamut of resources which are deposited as well as related copyright issues.

3.2.6 Liaison and co-ordination of activities with Research and Enterprise

Library and Research & Enterprise have worked closely together in the development of the funding data work and links to the Research System. We have jointly presented about the project and hosted a wide range of visitors who have wanted to know about our work in more detail. We have held a wide range of joint meetings and collaborated closely on the development of the funding data option in Enlighten. This work has also led to a further successful JISC bid led by Research & Enterprise, *Enquire* which will focus on impact.

4. Implementation

The planning and implementation of the project was focussed around three distinct but inter-related sets of data:

- REF pilot publications data - Excel spreadsheets arranged by Units of Assessment
- Staff data - held in the University's data vault
- Project/funder data – held in our Research System

We worked with this data and ensure that Enlighten became connected to and integrated with core institutional systems like the Research System and our data vault. This work was split between EPrints Services and IT specialists in our IT Services department.

EPrints Services developed a bespoke bulk import script for us for our REF data and implemented the author authority browse view. Our IT Services specialists added user accounts to Enlighten and developed the new funding workflow.

All of the work was developed and tested in our EPrints test service before being ported across to our live repository.

- Implementing Institutional Login [Staff data]
- Bulk import of content [REF pilot data]
- Creating an Author authority listing [Staff data]
- Adding funding data [project and award data]

The first three pieces of work listed were needed to be done in order to deal with the dependencies between staff and publications so that this data could be linked.

Code was provided by EPrints to enable our users to create a user record when they login but since we wanted to create a full Glasgow authors view we felt it was necessary to bulk import this data. This work is detailed in section 4.3 below.

4.1 Implementing Institutional Login (GUID)

During the project we added over 11,000 new user records for staff to the repository from our data vault. We had not expected it to be this many records, the University has six thousand employees but in order to be as comprehensive as possible we included Honorary and Associate staff who also have publications.

The user account names are their Glasgow Unique Identifier (GUID) and we included:

- Forename, surname and honorific
- Staff number
- E-mail address
- Department
- Faculty

We created a new field for staff number.

The screenshot shows a web form with two main sections: 'Account Details' and 'Personal Details'.
Account Details:
 - 'Email address:' field contains 'W.Nixon@lib.gla.ac.uk'.
 - 'Hide Email:' section has three radio buttons: 'Make email visible to all.', 'Hide email to all except repository administrators.' (which is selected), and 'UNSPECIFIED'.
 - 'Password:' field is empty.
Personal Details:
 - 'Name:' field is split into three sub-fields: 'Title' (Mr), 'Given Name / Initials' (William), and 'Family Name' (Nixon).
 - 'Department:' field contains 'Library'.
 - 'Organisation:' field contains 'University Services'.

Image 1 - User Account Details

These records enabled us to provide login access to our users using their GUID and the staff name is used in the author browse listing. We looked at the possibility of creating user accounts when users login rather than pre-populating them but because a key aim was to create a Glasgow authors listing we needed the author data in place. Such an appropriate is one we are considering for our theses service where we would not want to add accounts for every student but could make the account creation process more streamlined.

This work was done before the REF records were bulk imported, the import script tied publications to user accounts.

We have disabled “create account”, no one can now register to deposit or login to Enlighten.

All of these staff now have accounts in our repository, there is now no need to register or to create an account. Authentication to the repository is now done by via LDAP.



Image 2 - Login by GUID

4.1.1 Review of user records in Enlighten

Prior to the addition of the Glasgow records we reviewed the number of user records currently held in Enlighten and identified three tranches of user:

- Users with deposits and a Glasgow e-mail address
- Users with deposits and a non-Glasgow e-mail address
- Non-Glasgow users

The vast bulk of the non-Glasgow users were spam accounts. We exported a list of all of these accounts, with their e-mail addresses and then removed them to lock down access to the repository.

A number of early adopters/depositors to Enlighten now have two user accounts as a result of the bulk import of user records. We are working our way through these accounts and changing the ownership of their publications to their new GUID account prior to deleting them.

4.1.2 User login issues – and password resets

There have been some instances of users having difficulty logging into Enlighten with their GUID but this has been the result of mis-keyed or forgotten passwords. Since authentication is now via the University's data vault, password resets must be done via the central password self-service and not by Enlighten staff.



Image 3 - Password self-service

4.1.3 Impact

A key aim of *Enrich* was to lower barriers to deposit and enabling institutional logins for staff was a core element of this work. Since the creation of these accounts in December 2009 we have seen a marked increase in the number of different staff now adding records and depositing their papers.

4.2 Bulk importing REF Pilot data

A key component in ensuring that Enlighten fulfils its aim of becoming a comprehensive publications database for the University has been an ongoing programme of backfilling. This had two key strands: manual backfilling by University staff and the bulk import of REF publications.

In March 2009, there were: 4500 records with over 1500 fulltext PDFs (since February 2004). By March 2010, there were an additional 600+ fulltext PDFs and an ongoing increase in the number which are now being deposited.

Over the course of the project over 4,000 records have been manually added to Enlighten, almost as many as were added in the first 5 years of the service.

The project ambitiously aimed to have 30,000 records by the end of March 2009. We have got over 23,500 publicly available records [25,000+ in the system]. We focussed on peer-reviewed journal articles for the bulk import and imported more than 16,000 records in December 2009.

We have the import tools and have identified the gaps across the University in publications to take this work forward and ensure we have a comprehensive repository.

The ROAR chart³ below shows both the spike in content with the bulk import and the increase and frequency of daily deposits to the service over the last year.

³ Enlighten record in ROAR, <http://roar.eprints.org/582/>

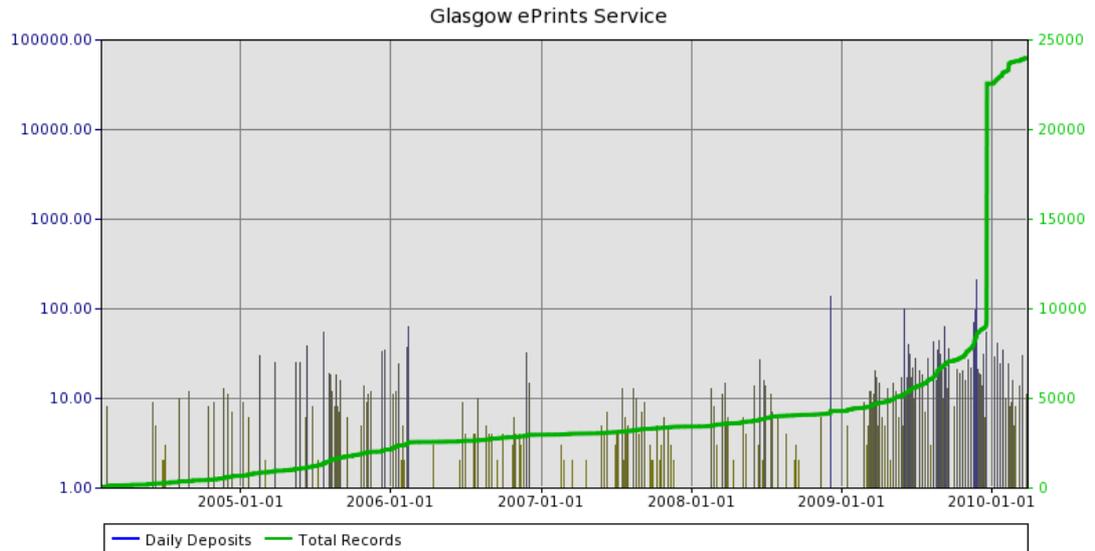


Image 4 - ROAR chart showing increase in deposits

4.2.1 Bespoke bulk import – and processing in Microsoft Access

EPrints provides a wide range of built-in import options including DOI and EndNote but for our REF data which was in Excel, EPrints Services wrote a bespoke import script for journal articles.

This script provided a couple of key value adds over the default imports in particular links created between staff and publications and duplicate checking.

Our REF data included staff numbers and working with colleagues in the Medical faculty we used Access to separately list all of the authors, identifying the Glasgow authors by their staff number.

EPrints Services wrote a script which took the Excel sheets, checked for duplicates, matched Glasgow authors and added the records straight into the live service. We didn't want to add these records to the Editorial Review since we felt with the numbers involved would overwhelm repository staff.

The bulk imported records don't have Library of Congress Subject Headings and we modified EPrints abstract view to remove "UNSPECIFIED" for those records

The Enlighten Staff Notes field shows record as bulk imported



Image 5 - Bulk import note

4.2.2 Dealing with duplicates and duplicates reporting

The REF import script caught duplicates, based on title and put them into the Editorial Review. As each Unit of Assessment was imported a short report was also created which listed the duplicates. This report enabled us to double-check that we already had the record and to enhance the existing record with GUIDs for Glasgow authors and the appropriate Glasgow department.

We have created a Duplicates user and once these updates were done, duplicates were moved out of the Editorial Review into the Duplicates Workarea. This has some 2,500 records.

4.3 Creating an author authority listing

A key request from academic colleagues over the years has been the option to easily view [and search] their own publication lists. EPrints 3.x provides a Browse by Person (People) view which is built from the author names in the EPrints record. This includes all the authors of a publication and separately displays all of the variations which a user has published under e.g. Nixon, W., Nixon, William or Nixon William J. This view, while comprehensive was not ideal for our purposes.



Image 6 - Browse by Person

In discussions with EPrints it was decided that a new, Browse by Glasgow Author view would be created which would use the author name in the user record rather than the EPrints record. This new view was dependent on the creation of the new user records.



Image 7 - Browse by Glasgow Author

This new view displays the full names of staff and their honorific e.g. Dr, Prof etc taken from the user record. During the project we upgraded to EPrints 3.1.3 which provides the much improved A to Z browseable list rather than having all of the authors listed on a single page.

A new GUID field was added to the Authors multi-value field and this field enables depositors to link publications to staff records by adding their unique Glasgow Identifier (GUID) in the author field.

This approach has enabled us to decouple the name used by an author in the citation of the paper from the name which they are identified by in the University’s central systems. All publications, for instance by a member of staff with both a maiden and married name are now grouped by the name they are known by in these systems.



Image 8 - Authors autocompletion option

This autocompletion option also gives us their University e-mail address. A caveat however is that the author autocomplete shows the Glasgow name which may be in a different format from the cited name and depositors **MUST REMEMBER** to change the name if the citation uses initials rather than a full forename.

EPrints Services created another file for us which shows a mapping of GUID, staff number and EPrints account, our IT Services team added this to the database which works with our Staff A to Z which means that we can also do publications lists like those that you mentioned. We have these in test at the moment and will roll them out later this year after we have given staff a chance to update and review their publications.

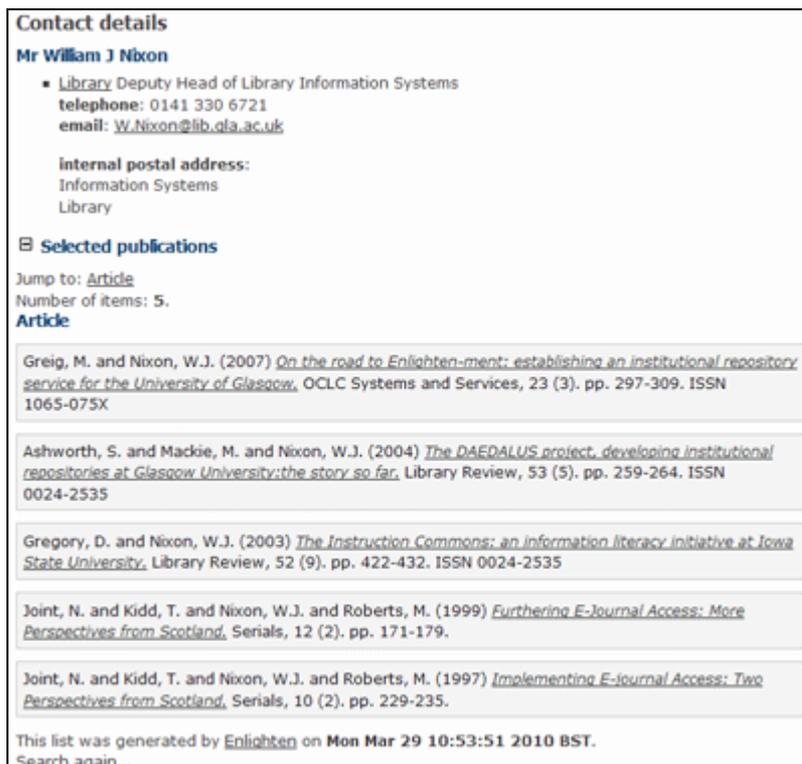


Image 9 - Staff Publications Profile

A lesson learned from the University of Northampton’s Nectar project⁴ was to add footer text which includes the text [and link]: “This list was generated by Enlighten on [date]” to maintain the connection and profile of the repository as the source of this data.

⁴ Nectar Project, <http://nectar.northampton.ac.uk/jisc.html>

4.4 Adding funder data

While work was being done with the addition of user records and the bulk import of bibliographic data which had distinct dependencies we focussed on the availability and use of funding data from our University Research System into Enlighten.

Enabling the ease of access to this data will effectively enable us to ensure research funding can be effectively (and accurately) mapped to publications and other research outputs. This funding data will enable us to readily identify funded outputs and demonstrate compliance with Open Access mandates.

4.4.1 New funding option in the deposit workflow

EPrints already provides fields for project and for funder and these can be completed in the Details section of the deposit workflow. These fields however did not support the rich set of funding data which we wanted to add to our records from the Research System. This data included:

- Project code number
- Award number
- Principal investigators [and associated project staff]
- Funder
- Funder Code
- Lead Department

We created new a multi-value Funder field which includes all of this data and added it to a new Funding workflow to enable project and funder data to be linked to publications.



Image 10 - Funding option in workflow

Creating this new section provided a higher profile for funder data but enabled staff who did not have funding data to complete could easily move past it.

4.4.2 New multi-value funder field and funder autocompletion

The new funder field does not directly search the Research System, instead the data is autocompleted from an exported file with data which maps to the new multi-value field. This data is exported on a daily basis and copied to Enlighten.

When staff type the project code, name etc they are offered a range of matching projects which when selected autocomplete with the data from the Research System. We do not expect staff to complete any of this information manually.

	Project Code	Award No	Project Name	Principal Investigator
1.				nixon
2.	Project Code: 40769 Award No: 1 "SHERPA DP (partner)"			
	Investigators: William Nixon, Library			
	Funded by: Consortium of University Research Libraries, Funder Code: CURL			

Image 11 - Multi-value funder field

4.4.3 Dealing with funders and awards

At the University of Glasgow a project can have multiple awards of funding attached to it, for instance funding may come from Wellcome and from the Scottish Government, each of tranche of funding is identified as a separate award so that we can more precisely tie a publication to a project and its distinct award.

In the majority of cases projects have a single funder but in order to ensure our mapping was as accurate (and future proofed) as possible we felt it was important to include this.

4.4.4 New research browse views

New research browse views were added to Enlighten. These provide us with browse views by funder name and code and provide us with options for reports for bodies such as the Wellcome Trust in the UK.

Research & Enterprise staff have been adding funding data records using the MRC’s e-Val data which have collected.

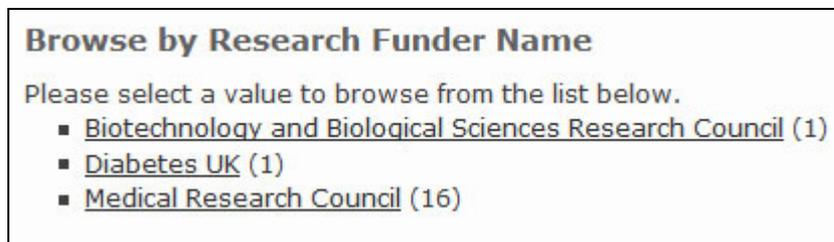


Image 12 - Browse by Research Funder Name

We also created a Research Project Code view which enables links from the Research System, with the project code to point to the associated publications.

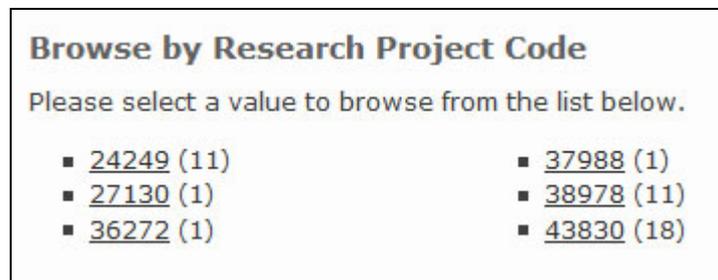


Image 13 - Browse by Research Project Code

Since not all of our Research Projects will have an associated browse view we updated the 404 page in Apache to show “No Data” rather than “page not found”.



Image 14 - No Data Available

Funder’s names for publications are now listed in individual repository records.

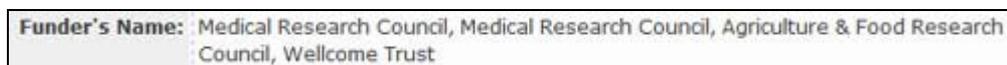


Image 15 - Funder's Names in an Enlighten record

Additional information including the project and lead investigator could also be made available in the EPrints record and we have enabled this in our test service. We will

demonstrate this to our Research Systems User Group later in April to ask for feedback.

4.4.5 Workflow changes and challenges

There are two key challenges for the funder data. The first is for the depositor, particularly if they are a proxy depositor to be able to identify the appropriate funding. We anticipate that here, the publications authors will need to be provide guidance.

The second challenge is for repository staff where funder data has been added. Since the data feed is only for funding which has been marked as “publicity yes” it is necessary for repository staff to check that the funder data added is publicly available before the publication is moved into the live archive.

They can do this by checking the Project/Award number, if the data matches the autocompletion options then there is no problem, but if the data does not match the details are passed to Research & Enterprise and the author contacted.

Research & Enterprise have taken the lead in developing and writing the policy for this funding data and the repository.

4.5 Other Repository developments

In addition to the core work which focussed on the integration of data the project added additional fields for journals articles, added the EPrints code for Twitter, set-up a top 100 list of Google search terms and implemented our OpenURL resolver on our test service. This work is detailed in the Enlighten Repository blog⁵.

4.5.1 Additional fields for journal articles

We have added three new fields for the journal article document type for Enlighten. These are:

- ISSN (Online) [Text]
- Journal Abbreviation [Text]
- Published Online [Date]

We wanted to clearly distinguish between printed and online ISSN’s and to be able to export the appropriate ISSN. The RAE2008 specified electronic ISSN for journal articles with DOIs.

Journal abbreviations were added to address the needs to disciplines such as Mathematics which use short names in their citations from the American Mathematical Society⁶.

The Published Online date was added as a result of data coming from our Faculty of Biomedical and Life Sciences. Many of their journal articles are published online, and in the public domain before the hardcopy. They don’t, initially have volume or issue data but do have online publication dates.

We added this and removed the mandatory flag from publication date since there may not be a hardcopy date available.

⁵ Enlighten Repository Blog, <http://enlightenrepository.wordpress.com/>

⁶ Abbreviations of names of serials, American Mathematical Society, <http://www.ams.org/msnhtml/serials.pdf>

Journal Name:	Advances in Mathematics
Journal Abbr.:	Adv. Math.
ISSN:	0001-8708
ISSN (Online):	1090-2082
Published Online:	21 September 2002

Image 16 - Additional Journal Fields

4.5.2 All a Twitter

EPrints released Perl code for tweeting⁷ latest additions to the repository to Twitter. We saved this code to a file called `twitter.pl` and dropped it into the `cfg.d` directory.

We launched on the 9th of June, with the Twitter account EnlightenPapers⁸. We have posted over 3350 updates and garnered an eclectic collection of followers which seems to have stabilised at around 140, with new followers balancing out those who find the stream of tweets too much.



Image 17 - EnlightenPapers on Twitter

4.5.3 OpenURL Resolver – Find More!

During the project we have been testing the University of Glasgow’s OpenURL resolver (from Innovative Interfaces Inc) which we call “Find More”. This builds on work done by repositories like Northampton’s Nectar⁹ which have implemented it for journal articles.

This will be launched in May 2010 in the live service. It is currently set-up for journal articles but we are extending this to include books and book sections. There have been over 1800 of these added to the Enlighten over the last year, the majority don’t have full text. “Find More!” provides an opportunity to minimise “digital dead ends” and to provide catalogue and other links to this material.



Image 18 - Find More link

4.5.4 Top 100 Search Terms [and Google Analytics]

Like many repositories we use Google Analytics to gauge access from referring sites, number of visitors and so on. Over 80% of access to Enlighten comes via search engines including Google, Google Scholar and Bing. GA also records search terms and

⁷ EPrints Wiki, Twitter code, <http://wiki.eprints.org/w/Twitter>

⁸ EnlightenPapers on Twitter, <http://www.twitter.com/enlightenpapers>

⁹ Nectar repository, <http://nectar.northampton.ac.uk/>

we have compiled a clickable list of our Top 100 searches¹⁰ which give a unique insight into what users are searching for and the records which they are accessing.

5. Outputs and Results

5.1 *Enhanced and integrated repository service*

Enlighten has now become a mainstream and core service for the University of Glasgow deftly fulfilling the twin roles of publications database and as a repository for open access research outputs.

5.1.1 Glasgow authors browse views

The creation of the more specific Glasgow author views now clearly associates publications with members of staff both in the repository and for re-use elsewhere in our web space. This work has now made it very easy for staff to see their publications [in different views e.g. by date or type] and to assess how complete it is.

5.1.2 Funder workflow

The funder workflow development work is now in place and early indications already show that some academic colleagues, when self-depositing are taking the time to add funding data to their record, in some cases where publicity in the past was marked as no.

The code and related formatting data about the funder information will be made available to the wider community via the Enrich project website.

5.2 *Ongoing dissemination*

The project has conducted a wide range of dissemination (and related presentations) during the project and beyond to both the repository/Library and research administrators communities.

Project documentation is available via the *Enrich* project website and the Enlighten Repository blog. The project website will also host the outputs and development of the *Enquire* project.

6. Outcomes

Enrich has clearly demonstrated both the need and the advantages of ensuring that the repository is integrated with wider University systems.

6.1 *Outcomes for the University*

Enrich was critical in contributing to the growth and development of our repository and enabling it to become a mainstream and truly embedded key service for the University. This can be demonstrated by the:

- 11,000+ local user records added and institutional login enabled [now some 12,500+ users]

¹⁰ Enlighten's Top 100 searchers, <http://www.lib.gla.ac.uk/enlighten/top100searches/>

- Links between the repository and the Research System (RS) to enable Funding data from the RS to be easily added to the repository.
- The implementation of a comprehensive repository and publications database with over 23,500 records publicly available
- Range of value added services including a Glasgow authors browse view, OpenURL resolver links and statistics which enhance access to the records and the full text.

6.2 Outcomes for JISC and the wider community

- A good practice model for managing the relationship between an institutional repository and a Research Systems through funding data and close co-operation with Research & Enterprise staff
- A good practice model for the use of an institutional repository service as a University wide publications database
- A good practice model for creating a comprehensive repository of published outputs which could be used to generate staff publications within their own departmental or home pages.
- A range of studies which demonstrate the effectiveness and strengths/weakness of different deposit models across different disciplines
- A good practice model demonstrating compliance with funders open access with funder data available via both funder name and local project code.

7. Conclusions

The work of the *Enrich* project has enabled us to deliver a mature and sustainable repository which is clearly integrated with institutional authentication systems and funder data. And one, which in its own right can deliver data out to populate staff profiles or provide links to associated publications from the Research System.

Enrich has provided a clear focus for the integration of the repository with other key institutional systems, including the Research System to enable the University to fulfil its Publications Policy.

We have increased the rate of content deposited through back-filling but more importantly by demonstrating the value [and reuse opportunities] to academic colleagues and departments in adding their research to the repository.

We believe that we can also be seen as an institutional exemplar for the benefits of integration between research systems and a repository, particularly in the areas of:

- People (Relationships)
- Processes
- Policies

7.1 People (Relationships)

Strong relationships between repository managers and staff at all levels are vital in supporting the deposit of content. We have extended this work beyond traditional advocacy activities to create active and ongoing partnerships with academic departments and staff working with the repositories.

We have run a variety of workshops, met with Heads of Department and addressed departmental meetings. We have worked to address the local content and process needs of departments, for example the journal abbreviations for the Mathematics department.

7.2 Processes

These include technical and administrative processes needed to join-up the existing elements of the research lifecycle which will facilitate the ease of deposit.

These include a single sign-on system, a wide range of import and data capture options, including DOI via Crossref and ongoing support for copyright clearance by the University Library. The implementation of clear and sustainable workflows has been a critical factor in the success of Enlighten.

7.3 Policies

With Enrich we have continued to refine our existing policies for deposit and the use of funder data. We have worked closely with Research & Enterprise in this work.

8. Implications

Over the last year to 18 months there has been a noticeable shift in the perception of the role(s) which the institutional repository can play and the need for repositories to truly become institutional. By that we mean, one which is connected, like a junction box to already existing institutional systems, services and process and not one which is merely a disconnected silo which has been installed by an institution.

8.1 The Research Excellence Framework and Repositories

The advent of the Research Excellence Framework, the rapid sector wide maturation of repositories [with much credit to JISC], and the onset of funder and institutional mandates have all converged to place new demands on repositories, one of these, as demonstrated by the *Enrich* project is the inclusion and availability of funding information for publications.

Until *Enrich*, our repository held details of the output but not the funding data and our Research System held details of the funding and awards but no correlating links to the publications. There is an increasing recognition (realisation) that in order for us to effectively manage these outputs and to readily provide reports to our funding bodies this data must be linked.

The changing licence and re-use landscape which providers like Thomson Reuters have introduced provide exciting new opportunities for repositories [and institutions] to provide additional “value added” data. This includes citation data as services like Scopus and Web of Knowledge make API’s available to embed this information. EPrints have continued to innovate in this area and recently demonstrated the use of SWORD for ISI data¹¹.

8.2 Connectivity and Policy Issues

While we have implemented our solution in an EPrints repository environment coupled with a bespoke Research System, the underlying principles of connectivity and related policy issues are portable and can be applied across the sector.

¹¹ Presentation: WoS data with SWORD-based tool, http://r4r.cerch.kcl.ac.uk/wp-uploads/2010/03/Carr_Using_WoS_data.pdf, 23 March 2010

It cannot be stressed enough that this is **not** just technical solution it requires ongoing engagement with researchers as well as the co-operation of engagement of Research and Enterprise and other key institutional services working in concert to lower deposit barriers and increase the information provided.

There is a concern, both locally, and we think across the community that we do not lose sight of the primary reason which repositories were set-up to address, open access and the free availability of research outputs. The work done to embed the repository more effectively will support Open Access by lowering barriers and providing support for OA deposits.

The development work of the *Enrich* project will be carried forward over the next 6 months by *Enquire*, its sister project which will focus on impact data and the range of different research outputs which are required by RCUK among others.

9. Recommendations

Enrich and the Readiness4REF project have demonstrated that the institutional repository has the potential [and capacity] to be the locus of a rich range of research output information.

This could include data for funder as well as a record of impact and is an area which we would recommend that JISC explore this work further.

We would recommend that institutions ensure that repository staff are given opportunities to meet, share information and identify potential synergies with staff in the Research Office. The repository and its supporting staff should actively seek to stitch themselves into the fabric of the institution.

10. References

List any references to the work of others you have cited (e.g. articles, reports, studies, standards), and any explanatory notes. Provide URLs for any materials available on the web.

10.1 Related Projects

Readiness4REF Project, <http://www.jisc.ac.uk/whatwedo/programmes/inf11/sue2/r4r>

The I-Wire Project, <http://blogs.cf.ac.uk/iwire/>