

Organisational structures: delivering resources to faculties

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For further information on the JISC and JISC Programmes, visit their Web site at <http://www.jisc.ac.uk/>.

For further information on e-Services Integration, visit their Web site at <http://www.acsweb.hull.ac.uk/imedia/>.

For further information on UKOLN, visit their Web site at <http://www.ukoln.ac.uk/>.

For further information on the PORTAL project itself, visit the project Web site at <http://www.fair-portal.hull.ac.uk/>.

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Introduction

The PORTAL project is funded to explore and document issues relating to the integration of external resources within the framework of an institutional portal. The ongoing development of the port.hull portal at the University of Hull acts as a testbed for much of the research activity being undertaken by the project.

There are many varying definitions of institutional portals available. The project's own working definition is:

a web-based layer which aggregates, integrates, personalises and presents information, transactions and applications transparently for the user according to their role and preferences.¹

Along similar lines, the National Science Digital Library's definition is:

An organized, coherent view of resources. Although it looks like a typical web page, it is actually generated dynamically to present an aggregation of information for a specific group.²

Thirdly, the Compass portal at the University of Nottingham offers the following:

a personalized and customized gateway designed for useful and comprehensive access to information, people, and processes... Portal content can include a wide variety of features, information, tools, and communication devices³

A common element in the definitions above is the focus on customisation of resources for groups and individuals. In order to provide this key service, it is necessary to match relevant available resources against users' known interests. One obvious method of categorising subject interests at a broad level is by membership of faculty or department. Therefore, as stated in the PORTAL proposal, the aim of this work package is to: 'survey the academic structures of a sample of institutions in order to document the issues in mapping from national to local'.

Rationale for examining national to local mappings

It is particularly significant for this workpackage that the PORTAL stakeholder consultation exercise⁴ revealed that the service users considered to be most useful is access to resources.⁵

Responding to common portal requirements discussed above, it is likely that most institutional portals will wish to offer some form of tailored information environment based on the department to which a user belongs. Faculties will usually be too broad. (Course or module information may be used in addition, together with personalised options for individual users.) Therefore, the portal will offer a 'view' to a department

member, which could include a range of relevant resources such as abstract and indexing services, document ordering, data archives etc, as well as course communications (eg essay titles and deadline reminders) and other local and remote services.

However, providers tend to use very different classification structures for organising their resources. They are rarely based on any standard subject classification, but instead developed in-house according to the perceived needs of the collections. This makes the mapping of national resources to organisational structures very difficult for institutions developing portal-type services.

The problem is compounded by the need to automate the mapping procedure, since it would be extremely time-consuming to do this manually (and on an ongoing basis, as new resources became available).

It is hoped that by highlighting some of the organisational issues involved, this workpackage investigation will help facilitate the customisation of portals to support delivery of externally provided content along lines compatible with the underlying organisational structures of the institution.

Why is department-based access needed?

Users cannot search across all available information resources for several reasons. Firstly from a systems administration point of view, there would simply be too many resources to sensibly present in the user interface. Resources would then have to be searched individually, since it would not currently be possible to cross search a very wide range of disparate systems. From a practical point of view, this is also undesirable (since it is wasteful of time and processing power). A more sensible approach is to group resources by broad subject area, by faculty, or with reference to a more specific organisational unit with which the user is familiar and comfortable, such as their department or course of study.

How do other portals provide services to departments?

It would be useful to look firstly at how some other institutional portals have provided access to resources along faculty, departmental, or other lines. However many portals are in the early stages of development. For those that are up and running, it is often difficult to get a meaningful picture of the services offered, since only very limited access is made available to 'guest' users. The reason is clearly to protect institutional data, but it is frustrating for research purposes. This was also experienced during research for the workpackage 3 literature review⁶. Of the uPortal sites, a number are still under development. Cornell University⁷ is one of the few that allows guest demo login. Most of the others just provide some very brief information (eg weather) on the home page, and require institutional membership login for any further services. Most seem to have been customised, but all still have the same basic uPortal feel, with selection of options from (card catalogue style) tabs along the top of the page. The National Science Digital Library (NSDL)⁸ however (without guest login) offers some content, with a search interface to collections available. myColumbia⁹ at Columbia University offers a campus web search.

The most useful portal discovered, in terms of viewing department-type resource access, was SuperSearch at the University of Technology Sydney¹⁰. This portal allows cross searching of library catalogues and databases. It offers a drop-down list of around 25 'resource categories' (mostly subject-based) available. On selecting a category, the available resources are listed (library catalogues, web gateways, databases). 'My Resource list' can be used to store specific resources routinely used. The portal is based on MetaLib and SFX from the library systems vendor, Ex Libris.

The University of Buffalo provides useful demos of its portal, MyUB¹¹. Different versions have been developed for undergraduates, post-graduates, teaching staff and administrative staff. The 'faculty' demo, for example has been set up for a member of academic staff in medicine, so 'My Library' includes a 'Recommended databases' section including MEDLINE. The 'graduate' demo includes general 'Databases by subject'; clicking on a subject leads to a list of searchable resources available at the University; these have not been customised for the demonstration. 'My Library Links' (which has an edit button) is used for adding one's own links. MyUB provides a more extensive view than other portals of the types of services that can be offered.

The Queensland University of Technology's QUT Virtual¹² portal provides a Personal Profile for all staff and students, which offers 'personalised information in a

customisable way'. Guest login is provided, but it only describes possible services, and does not actually perform any functions.

UD&me at the University of Delaware aims to be a 'pocket-sized' version of the campus Web. UD&me allows viewing of 'personalized information, from a variety of sources, in one convenient place'.

Methodology/outline

Given the aims of the workpackage, it was felt that it would be most relevant to carry out investigations based on organisational and resource information available on the web. This provided the basic data required for the mapping exercises, which form a key part of the study.

Section 1 documents the structures of some key information services, Section 2 looks at subject classifications for courses, while Section 3 examines a sample of institutional structures, with mappings to the RDN. In order to document the issues, it was necessary to carry out some sample mapping. Given the results, Section 4 progresses to mapping from institutional courses to more detailed RDN headings.

Some of the issues raised in this workpackage will be taken forward in workpackage 9 (developing a set of subject terms for describing RDN resources) since in an academic context organisational and subject terms are often the same.

Section 1: structures of some key services

The Resource Discovery Network

The Resource Discovery Network¹³ (RDN) is a co-operative network consisting of a central organisation, the Resource Discovery Network Centre (RDNC), and a number of independent service providers called Hubs. There are currently (June 2003) seven Hubs which produce descriptions of quality Internet resources for a number of subject areas. Several more Hubs are under development. In particular, ArtIfact - Arts and Creative Industries will be launched in November 2003. The RDN home page provides a browse structure based on the current Hub subjects, with 12 broad top level topics at the time of writing. ('Reference' was previously also rather awkwardly included here, but has now been removed.) The subjects are listed below, with the name of the Hub provider in brackets:

- Business (SOSIG)
- Computing (EEVL)
- Engineering (EEVL)
- Geography & Environment (GSource)
- Health & Medicine (BIOME)
- Humanities (Humbul)
- Law (SOSIG)
- Life Sciences (BIOME)
- Mathematics (EEVL)
- Physical Sciences (PSIgate)
- Social Sciences (SOSIG)
- Hospitality, Leisure, Sport & Tourism (ALTIS)

Two or three sub topics are also listed under each broad topic (with one exception). Each topic provides direct access to the individual Hub browse/search pages. On choosing Social Sciences, for example, the user is taken directly to the SOSIG home page; choosing Physical Sciences takes the user to PSIgate, which has a different user interface.

Selecting a browse term in SOSIG for example, takes the user down a level to a more detailed set of subject terms. Selecting one of these second level terms leads to the actual records. There is also a SOSIG search box, for direct searching of terms, with the aid of various thesauri. There is an option to search the whole SOSIG catalogue or a subset.

Alternatively, RDN offers 'ResourceFinder' which searches across all the Hubs simultaneously. This is a full-text keyword search, looking for matches in resource title, description and subject fields. Boolean operators can be used.

Of particular interest to portal developers is RDN Include¹⁴, which is designed to allow institutions to easily include RDN services on their own web sites and retain their own look-and-feel. Several standard Include services are offered, to cater for various levels of technical expertise. In addition, for those wishing to develop their own applications, the RDN offer a number of interfaces, and will develop others. There is also a Z39.50 target for all RDN records.

The RDN provides a useful document, 'Working with the RDN'¹⁵ which 'describes the technologies and interfaces supported by the RDN that allow third-parties to interact with RDN services'.

The availability of RDN Include services represents a significant move away from the traditional commercial resource provider's approach, where protection and branding concerns have been paramount. The RDN is of course fortunate in being funded by the UK further and higher education funding councils and is resourced to develop innovative service provision. However, with increased discussion and awareness of the value of reusable content of various kinds, it is hoped that other resource providers will realise the advantages to be gained by offering more flexible interfaces.

LTSN

The Learning and Teaching Support Network¹⁶ (LTSN) consists of a network of 24 subject centres based in higher education institutions throughout the UK and a Generic Centre offering expertise and information on learning and teaching issues that cross subject boundaries. The subject centres are:

- Art, Design and Communication
- Bioscience
- Built Environment
- Business Management and Accountancy (BEST)
- Economics
- Education (ESCALATE)
- Engineering
- English
- Geography, Earth and Environmental Sciences
- Health Sciences and Practice

- History, Classics and Archaeology
- Hospitality, Leisure, Sport and Tourism
- Information and Computer Sciences
- Languages, Linguistics and Area Studies
- Law (UK Centre for Legal Education)
- Materials (UK Centre for Materials Education)
- Maths, Stats and OR (Operational Research) Network
- Medicine, Dentistry and Veterinary Medicine
- Performing Arts (PALATINE)
- Philosophical and Religious Studies
- Physical Sciences
- Psychology
- Sociology, Anthropology and Politics
- Social Policy and Social Work (SWAP)

The LTSN Generic Centre aims to broker expertise within UK HE and promote best practice in learning and teaching across all disciplines.

As an example, the LTSN Subject Centre for Languages, Linguistics and Area Studies offers a facility to 'browse resources by keyword'. This offers a mixture of broad subject headings eg German, methodologies eg 'independent learning', approaches eg 'Internet' and programmes eg Erasmus.

A mapping from the LTSN Subject Centres to the RDN Hub top level headings is included below.

JISC Resource Guides

JISC provides a range of 'Resource Guides'¹⁷, designed to direct staff and students to high quality resources. The seven subject areas covered are:

- Arts and Humanities
- Engineering, Mathematics and Computing
- Geography and the Environment
- Health and Life Sciences
- Hospitality, Leisure, Sport and Tourism
- Physical Sciences
- Social Sciences

Each of the Resource Guides is arranged in six categories:

- Bibliographic, reference and research information
- Publications online
- Subject gateways
- Data services
- Learning and teaching
- Support services

The guides are compiled by Resource Guide Advisors, in consultation with subject-based advisory groups.

The Guides make it clear that they do not attempt to be comprehensive: the focus is primarily on resources funded by JISC, although some 'significant and complementary resources and initiatives funded by other bodies have been included'.

Therefore, the Arts and Humanities Resource Guide, for example, under 'Data services', provides access to the 2001 Census, the Archaeology Data Service, the AMICO Library, SCRAN and the History Data Service, amongst others.

The Resource Guides also provide training sessions to raise awareness of the resources and how to use them most effectively.

AHDS

The Arts and Humanities Data Service (AHDS)¹⁸ aids the discovery, creation and preservation of digital collections in the arts and humanities. It is organised by an Executive and consists of five Subject Centres based at various higher education institutions: Archaeology Data Service, History Data Service, Oxford Text Archive, Performing Arts Data Service, Visual Arts Data Service.

The former AHDS gateway has been phased out so there is currently no cross-searching facility. However at the time of writing an Arts and Humanities Portal (AHP) is being developed, to allow cross-searching of all AHDS catalogues. Portal development is being carried out by the Subject Portals Project (SPP)¹⁹ and the software will be used by a number of the Resource Discovery Network (RDN)²⁰ subject hubs.

Access to the AHDS collections is therefore available via the Subject Centres' individual online catalogues. The AHDS manages around 5,000 high-quality data resources and provides access to many other complementary resources which are managed by selected third parties.

Section 2: subject classifications for courses

Joint Academic Coding System (JACS)

The JACS²¹ subject classification resulted from the UCAS (Universities & Colleges Admissions Service) and HESA (Higher Education Statistics Agency) subject code harmonisation project in 2000. It was first used for courses for students entering HEIs through UCAS in 2002, and for those included in HESA data collections made during 2002/03²². Mappings were provided from the subject coding systems previously used by UCAS (the Standard Classification of Academic Subjects) and HESA (HESACODE).

JACS offers 19 top level terms, or 'Subject Groups', each accompanied by a letter.

- A Medicines and Dentistry
- B Subjects Allied to Medicine
- C Biological Science
- D Veterinary Sciences, Agriculture and related subjects
- F Physical Sciences
- G Mathematical and Computer Sciences
- H Engineering
- J Technologies
- K Architecture, Building and Planning
- L Social Studies
- M Law
- N Business and Administrative Studies
- P Mass Communications and Documentation
- Q Linguistics, Classics and related subjects
- R European Languages, Literature and related subjects
- T Eastern, Asiatic, African, American, and Australasian Languages, Literature and related subjects
- V Historical and Philosophical Studies
- W Creative Art and Design
- X Education

A much larger number of 'Principal subjects' provide second level headings; some of these are expanded into third and fourth level terms.

UCAS web browse list

UCAS also maintains a 'subject' list on its web site, covering courses available at UK institutions²³. It is used for searching degree and HND-level courses on the UCAS web site. In fact, it is not so much a subject list as a keyword in title list, since all the terms seem to be taken from the titles of courses. It therefore contains such terms as 'abroad' (for courses with a study year abroad), 'two', 'small'.

The alphabetical lists can be browsed, and the number of courses containing a particular term is displayed. Some subjects (eg Accountancy) that have a large number of courses attached are broken down into 'specific categories' (eg Management accountancy). Alternatively, subjects can be combined with another subject, or the search can be refined by region.

Section 3: institutional structures, with mappings

This section presents a survey of the academic structures of a sample of institutions. They were selected to represent a cross section of UK universities and colleges; many of these may provide portal facilities to their users in the future. The institutions included to represent the various communities of interest are: University of Hull ('red brick'), University of Bath (1960s), University of Lincoln (post-92), Belfast Institute of Further and Higher Education (FE), London Institute (federated structure of five specialist colleges).

The institutions chosen to survey are mostly the same as those used in PORTAL workpackage 3 (Defining portal requirements). There is however one variation: Newark and Sherwood College was not included because of a lack of organisational information available on the web; Belfast Institute was substituted instead. University of Bath and University of Hull were chosen primarily because they are the home institutions of the project partners.

Many institutions are growing rapidly in size as a result of increased student numbers. There has also been a general trend towards mergers for some years, often meaning that small specialist colleges are swallowed up by larger general institutions; more recently there have been mergers of large universities to form super-institutions. The merger in 2002 of University of North London and London Guildhall University to form London Metropolitan University is an example which others may follow. Institutional structures may therefore change over time and portal structures should incorporate enough flexibility to manage this.

These types of organisational change mean that already-complex academic structures become more complex again. This is not just because of the scale: there may be some duplication or overlap between merged sites (which could change as mergers become more streamlined). Again flexibility is required.

There is a standard terminology issue which is frequently encountered: different institutions use the terms 'faculty', 'department', 'school' etc to mean different things. There are also many inconsistencies in listings within institutions: some faculty lists include specialist research centres.

University of Hull

Academic structure

The University of Hull has two main sites: one in Hull, and the other in Scarborough. It has a total of 16,614 students. There are two faculties: Faculty of Science and Faculty

of Arts. Within these there is a broad range of academic departments²⁴. Strangely, the number of undergraduate courses²⁵ listed is much smaller than the number of departments. This is partly because some units only teach at postgraduate level, and also because many of the units listed are not teaching departments.

Mapping to RDN

University of Hull 'departments'	RDN top level subjects
Academic Medicine [Division of]	Health & Medicine
Academic Psychological and Primary Care Medicine [Division of]	Health & Medicine
Accounting and Finance	Business
American Studies	Humanities
Applied Statistics Centre/Information by Design Ltd	Mathematics
Arts [Scarborough Campus, School of]	Humanities
Arts and Humanities [Scarborough]	Humanities
Arts and Social Sciences [Faculty of]	Humanities Social Sciences
Biological Sciences [Department of]	Life Sciences
Burglary Evaluation Team	-
Business and Leisure Management [Scarborough]	Business Hospitality, Leisure, Sport & Tourism
Business Language Bureau	Business
Business School	Business
Cancer [Division of]	Health & Medicine
Cell and Molecular Medicine [Division of]	Health & Medicine
Chemistry	Physical Sciences
Chemistry in Industry [Institute for]	Physical Sciences
City Learning Office	-
City and Regional Studies [Centre for]	Geography & Environment
Coastal Studies [Scarborough Centre for]	Geography & Environment
Combined Languages	Humanities
Comparative and Applied Social Sciences	Social Sciences
Computer Science [Department of]	Computing
Creative Music Technology [Scarborough]	-
Criminology and Criminal [Centre for]	Law
Dance [Scarborough]	-
Design Enterprise Centre	-
Digital Arts [Scarborough]	-
Drama	Humanities
Economic Policy [Centre for]	Social Sciences
Economics	Social Sciences
Education [Scarborough School of]	Social Sciences
Educational Development Team	Social Sciences

Educational Studies [Centre for]	Social Sciences
eLearning Team	-
English [Scarborough]	Humanities
English and cultural studies	Humanities
Engineering [Department of]	Engineering
Estuarine and coastal studies [Institute of]	Geography & Environment
EUROCALL	-
European Public Law	Law
European Studies	Humanities
Film Studies	Humanities
Fine Art	Humanities
Fisheries [Hull International Fisheries Institute]	Geography & Environment
French	Humanities
Gender Studies	Social Sciences
German	Humanities
Geography	Geography & Environment
Graduate School	-
Health Studies	Health & Medicine
Hispanic Studies	Humanities
History	Humanities
Human Resource Management and Organisational Behaviour	Business
Humanities	Humanities
ICT Training Team	Computing
International Accounting and Finance	Business
International Leadership Centre	Business
Internet Computing	Computing
Italian	Humanities
Language Institute	Humanities
Law School	Law
Learning Development [Centre for]	Social Sciences
Learning [Institute for]	Social Sciences
Learning Partnerships Office	-
Lifelong Learning [Centre for]	-
LTSN C & IT Centre	-
Management and Organisational Learning [Centre for]	Business
Management Systems	Business
Maritime Historical Studies Centre	Humanities
Marketing and Business Strategy	Business
Marketing and Communications [Centre for]	Business
Mathematics [Department of]	Mathematics
Mathematical Science and Applications [Hull Institute for]	Mathematics
Maths Advice and Co-ordination Service	Mathematics
Medical Engineering Centre	Health & Medicine

Medical School [Hull]	Health & Medicine
Medical School [York]	Health & Medicine
Metabolic and Physiological Medicine [Division of]	Health & Medicine
Modern Languages [Department of]	Humanities
Music	Humanities
Nursing, Social Work and Applied Health Studies [School of]	Social Sciences
Philosophy	Humanities
Physical Sciences [Department of]	Physical Sciences
Physics	Physical Sciences
Politics and International Studies [Department of]	Social Sciences
Postgraduate Medical Institute	Health & Medicine
Regional Business Development [Centre for]	Business
Science [Faculty of]	Life Sciences Physical Sciences
Social Policy	Social Sciences
Social Work	Social Sciences
Sociology and Anthropology	Social Sciences
South-East Asian Studies	Humanities Social Sciences
Spanish	Humanities
Sport Science [Department of]	Hospitality, Leisure, Sport & Tourism
Study Advice Services	-
Surface Engineering [Research Centre]	Engineering
System Studies [Centre for]	-
TELL Consortium	-
Theatre Studies [Scarborough]	Humanities
Theology	Humanities
Waste and Pollution Research [Centre for]	Geography & Environment
Wetland Archaeology and Environments Research Centre	Geography & Environment

Even though a mapping has been achieved for most terms, the vast majority of the mappings are necessarily to a much broader term, since the RDN top level subjects are extremely broad. Search results consequently may be of limited value. As an extreme example, South-East Asian Studies (see above) covers both history and social and economic areas so therefore has been mapped to Humanities and Social Sciences, which does not appear to be useful, although unavoidable.

University of Bath

The University of Bath is a comparatively small university (currently 10,431 students in total), although like other institutions, it is growing rapidly and aims to double in size,

partly as a result of expansion at the new Swindon campus. However, the subject range of courses on offer is still relatively small compared to some larger universities.

Academic structure²⁶

The 'Academic structure' web page lists the three faculties plus the School of Management and the Division of Access and Continuing Study. Departments are listed under each faculty. The 'Academic Faculties & Departments'²⁷ page includes links to the department web pages, with full information about courses and research.

- Faculty of Engineering & Design
 - Department of Architecture & Civil Engineering
 - Department of Chemical Engineering
 - Department of Electronic & Electrical Engineering
 - Department of Engineering & Applied Science
 - Department of Mechanical Engineering
- Faculty of Humanities & Social Sciences
 - Department of Education
 - Department of European Studies & Modern Languages
 - Department of Economics & International Development
 - Department of Psychology
 - Department of Social and Policy Sciences
- Faculty of Science
 - Department of Biology & Biochemistry
 - Department of Chemistry
 - Department of Computer Science
 - Department of Mathematical Sciences
 - Department of Medical Sciences
 - Department of Pharmacy & Pharmacology
 - Department of Physics
 - Department of Sport & Exercise Science
- School of Management
- Division of Access & Continuing Studies

Mapping to RDN

University of Bath departments	RDN top level subjects
Architecture & Civil Engineering	[Engineering]
Chemical Engineering	Engineering

Electronic & Electrical Engineering	Engineering
Engineering & Applied Science	Engineering
Mechanical Engineering	Engineering
Education	Social Sciences
European Studies & Modern Languages	Humanities
Economics & International Development	Social Sciences
Psychology	Social Sciences
Social and Policy Sciences	Social Sciences
Biology & Biochemistry	Life Sciences
Chemistry	Physical Sciences
Computer Science	Computing
Mathematical Sciences	Mathematics
Medical Sciences	Health & Medicine
Pharmacy & Pharmacology	Physical Sciences
Physics	Physical Sciences
Sport & Exercise Science	Hospitality, Leisure, Sport & Tourism
[School of Management]*	Business

* The School of Management is a top-level term (in practice, it is counted as a faculty); it is not divided into departments. The resulting resources could therefore be too broad.

Partly as a result of the smaller number of departments and subjects covered at Bath, the mapping is more straightforward, with more equivalence between terms.

However, there are still several department subjects which are mapped to broader terms. Architecture and Civil Engineering is mapped to Engineering, but the latter is enclosed in square brackets since it only covers part of the mapped term.

University of Lincoln

The University of Lincoln²⁸ is a 'post-92' university. It has six faculties, which are divided into both departments and schools.

Academic structure

- Faculty of Applied Computing Sciences
 - Department of Computing
- Faculty of Art, Architecture & Design
 - Department of Fine Art
 - Department of Architecture
 - Department of Design
- Faculty of Business & Management
 - Department of Corporate Strategy
 - Department of Human Resource Management

- Department of Marketing
- Faculty of Health & Life Sciences
 - Department of Biological Sciences
 - Lincolnshire Institute for Health
 - Department of Psychology
- Faculty of Media & Humanities
 - Department of Journalism & Humanities
 - Department of Media Production
- Faculty of Social Sciences & Law
 - Department of Law
 - Department of Policy Studies
 - Department of Tourism & Recreation
- Hull School of Health & Social Work
- European Policy Research Centre

Individual courses are listed for a few departments only, on the same web page.

A new faculty structure was introduced in 2002. In addition to the six faculties above, there are also three other centres: International Institute for Educational Leadership, Lincolnshire School of Agriculture and Institute of Medical Sciences.

Course information is available separately. On selecting a course type (eg Undergraduate Degree/HND), an alphabetical list of course subjects is displayed.

Mapping to RDN

University of Lincoln departments	RDN top level subjects
Computing	Computing
Fine Art*	-
Architecture	-
Design	-
Corporate Strategy	Business
Human Resource Management	Business
Marketing	Business
Biological Sciences	Life Sciences
Lincolnshire Institute for Health	Health & Medicine
Psychology	Social Sciences
Journalism & Humanities	Humanities
Media Production	-
Law	Law
Policy Studies	Social Sciences
Tourism & Recreation	Hospitality, Leisure, Sport & Tourism
Hull School of Health & Social Work**	Health & Medicine

European Policy Research Centre**	Social Sciences
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** Support for arts-related subjects will be provided by the new RDN Hub, ArtIfact*

***The last two centres are listed at faculty level*

A larger proportional number of department subjects could not be mapped in this case; this will improve when ArtIfact becomes available.

Belfast Institute of Further and Higher Education

Belfast Institute²⁹ is included here as a representative of FE colleges. This is a variation from PORTAL workpackage 3, which included Newark and Sherwood College, since the latter does not make departmental information available on the web.

Belfast Institute is located in six main sites, five smaller buildings and over 100 out-centres across the city. It has eight 'departments', which are divided into 'centres'. On selecting a centre, available courses are listed.

Academic structure

- Business and Management
 - Business Education
 - Management Education
- Community Education and Training
 - Adult and Community Education
 - Training and Employment Services
- Computing and Administrative Studies
 - Administrative Studies
 - Business Information Technology
 - Computing & Software Engineering
 - Information Technology Applications
 - IT and Administration – Short Courses
 - NVQ and Training
- Continuing Education
 - Childhood Studies
 - Education Training and Counselling
 - Key Skills
 - Learning Support
 - Modern Languages
 - Social Work/Social Care

- Training in Communication Skills
- Creative and Health Studies
 - Fashion and Textiles
 - Hairdressing, Beauty and Sports Therapy
 - Media and Communication
 - Performing Arts
 - Science and Health
 - Visual Arts
- General Education
 - GCSE Courses
 - One Year A Level Courses
 - Two Year A Level Courses
 - University Access Courses
- Hospitality, Leisure and Tourism
 - Catering and Food Production
 - Hospitality Management
 - Leisure and Sports Studies
 - Travel and Tourism
- Technology
 - Aeronautical, Manufacturing and Plant Engineering
 - Building and Civil Engineering
 - Electrical Engineering
 - Electronic and Mechatronic Engineering
 - Fabrication, Welding and Foundry
 - Mechanical and Decorative Services
 - Motor Vehicle Engineering
 - Timber and Trowel Trades

There is also a separate 'Curriculum Area' list (which includes 33 subject areas), which in turn leads to listings of courses within these areas. There are course searches available by keyword and by criteria (eg part-time, level).

Mapping to RDN

Belfast Institute 'departments'	RDN top level subjects
Business and Management	Business
Community Education and Training	-
Computing and Administrative Studies	Computing
Continuing Education	-

Creative and Health Studies	-
General Education	-
Hospitality, Leisure and Tourism	Hospitality, Leisure, Sport & Tourism
Technology	-

Subjects such as geography, biology, mathematics, chemistry and physics are offered as A levels, but do not form part of the organisational structure.

This is the least successful mapping to RDN so far, mainly because of the practical nature of many of the subjects.

London Institute

The London Institute³⁰ brings together into a 'federated' structure five art and design colleges: London College of Printing, London College of Fashion, Camberwell College of Arts, Chelsea College of Art and Design, Central Saint Martins College of Art and Design. It has 18,649 students in total. The colleges do not seem to be structured into faculties or departments, presumably since they are relatively small. They are instead organised by course. Courses are all listed by level on the central web site; undergraduate level courses are therefore listed below.

Since all the courses offered are specialist by nature, it is impossible to sensibly map almost all of the subjects taught to current RDN top level subjects. This clearly highlights the need for the arts and creative industries Hub. Without the availability of ArtIfact at the time of writing, there are only two realistic relations suggested below, for London College of Printing. ('Marketing and Advertising' and 'Retail management' could be mapped to 'Business'.) It seems unlikely that relevant resources would be available for any other broad mappings to 'Business'. However, the situation will change when ArtIfact becomes fully available. At this high level, all the courses for all the colleges could simply be mapped to 'Arts and Creative Industries'. It is worth noting that London Institute is one of the ArtIfact partners.

ArtIfact is due to be officially launched in November 2003. At the time of writing a preview version of the service has been made available. The home page notes that the site will be changing as new areas are developed, and feedback from the preview service is processed.

Looking more widely at other arts-related information resources, it is likely that VADS (the Visual Arts Data Service)³¹, which is part of AHDS (discussed above) could hold relevant resources for London Institute users. However it was not possible to map to VADS either, since the web site currently provides a list of collection titles (and links to

access information), with no subject access. Likewise, it may be possible to map to VADS collections, when the AHDS portal becomes available, as described above.

Camberwell College of Arts

Undergraduate level courses

- Ceramics
- Conservation
- Drawing
- Graphic Design
- Illustration
- Painting
- Photography
- Sculpture
- Silversmithing and Metalwork

No mapping to RDN is currently possible.

Central Saint Martins College of Art and Design

Undergraduate level courses

- Acting and Directing
- Arts and Design
- Ceramic Design
- Fashion
- Fine Art
- Graphic Design
- Jewellery Design
- Product Design
- Textile Design
- Theatre: Design for Performance

No mapping to RDN is currently possible.

Chelsea College of Art and Design

Undergraduate level courses

- BA Honours Design for communication
- BA Honours Interior & Spatial Design
- BA Honours Textile Design
- BA Honours Fine Art

- New Media
- Painting
- Sculpture
- BA Honours Practice & Theory of Visual Art

No mapping to RDN is currently possible.

London College of Printing

Undergraduate level courses

- Book Arts
- Digital Media Production
- Film and Video
- Graphic and media design
- International Travel
- Journalism
- Marketing and Advertising
- Media and Cultural Studies
- Photography
- Print Media Management
- Publishing
- Retail Design Management
- Retail Management
- Sound Design
- Surface Design
- Visual Merchandising Management

Possible mapping:

- Marketing and Advertising -> (RDN) Business
- Retail management -> (RDN) Business

London College of Fashion

Undergraduate level courses

- Costume, Technical Effects and Make-up for the Performing Arts
- Fashion Design Technology
- Fashion Management

- Fashion Photography
- Fashion Promotion
- Fashion Studies
- Product Design and Development

There is a possible relation between 'Fashion management' and 'Business' and 'Fashion promotion' and 'Business'; however it seems unlikely that relevant resources would be available.

Issues for delivery of resources to departments

It is understandable that there are many inconsistencies in the listed structures of academic institutions (eg mixing of faculty, department and specialist research institutes at the same level). Universities and colleges have developed sometimes over hundreds of years, and it is difficult to fit organic structures into neat boxes.

Mapping issues

In some cases it was not appropriate to carry out methodical mappings, since it was immediately apparent that mapping would be impossible. It was initially hoped to map each institutional structure to RDN as a baseline, then each to another more specialist resource (which would be relevant to that institution). However, suitable relevant specialist resources could not be identified.

Whilst the RDN mapping exercise was useful in raising a number of issues, the RDN top level headings are so broad that this level of mapping is likely to be of little practical value to many institutions.

Many generic mapping issues apply to this survey. When there is no direct equivalent, for example, it is often necessary to use broader or narrower terms (BT, NT) for institutions. It is likely to be more problematic if mapping narrower terms (there is potential for confusing search results, if searching a resource with a much broader scope). Therefore if an 'equivalent' mapping cannot be achieved, is it preferable (from the user's point of view) to simply omit the mapping, or to include it, accepting that the match is partial, and may retrieve some unexpected results?

For some institutions it would have been useful to use a mixture of levels of heading (ie faculty/department), in order to achieve sensible mappings (otherwise eventual user searches could be misdirected and/or return confusing results). In practice, using a mixture of heading levels is undesirable. It could also create problems for automated mapping. However the alternative sometimes is to offer no mapping.

Other standard mapping issues include semantics, where different services may use the same term, but with different meanings. One source could be much broader in subject coverage than another despite apparently identical terms.

From a systems point of view, multiple resources will need to be mapped to a single department, and some resources will require mapping to multiple departments.

Section 4: Course mapping

It was felt that it would be easier in some cases (such as the University of Hull) to map from courses, rather than departments, since department listings tend to contain a number of specialist centres in addition. It would also make sense, more importantly, from a resource retrieval point of view. Since the aim of this workpackage was to explore organisational structures, this is a slightly separate issue, addressing another type of mapping. However, given the largely unhelpful results of the mappings from departments to RDN top level terms, it was seen to be a more practical option, and worth investigating for the purposes of this workpackage.

Since a more detailed subject list was required than the top level RDN terms it was decided to use the next level down. Therefore the top level terms for all the individual hubs were brought together into one listing (included at Appendix A, for reference). These were then mapped from University of Hull undergraduate courses, as below. Undergraduate courses were chosen, since they are the most numerous and best reflect the range of subjects covered.

The mapping table also includes the Department to which each course belongs, and the RDN top level headings, to aid comparison.

University of Hull undergraduate course mapping

University of Hull undergraduate course	Department	Hub top level headings	RDN top level subject
Accounting/ Financial Management	Accounting and Financial Management	Accounting Profession	Business
American Studies	American Studies	American Studies	Humanities
Archaeology	Archaeology	Archaeology	Humanities
Biological Sciences (Hull)	Biological Sciences	Biological and biomedical sciences	Life Sciences
Biological Sciences (Scarborough)	Biological Sciences	Biological and biomedical sciences	Life Sciences
Biomedical Sciences	Biomedical Sciences	Biological and biomedical sciences	Life Sciences
Business	Business School	-	Business
Business, Management/IT	Business and IT Management	Management	Business
Chemistry	Chemistry	Chemistry	Physical Sciences
Combined Languages	Combined Languages	Modern Languages (General)	Humanities
Computer Science	Computer Science	Computing General	Computing
Creative Music Technology	Creative Music Technology	-	-
Criminology/Social Policy and Social Justice	Centre for Criminology and Criminal Justice	General Law	Law

Dance	Dance	-	-
Digital Arts/Design for Digital Media	Digital Arts	-	-
Drama	Drama	-	Humanities
Economics	Economics	Economics	Social Sciences
Educational Studies	Centre for Educational Studies	Education	Social Sciences
Educational Studies (Scarborough)	Scarborough School of Education	Education	Social Sciences
Engineering and Technology	Engineering	Engineering	Engineering
English (Hull)	English	English Studies	Humanities
English (Scarborough)	English (Scarborough)	English Studies	Humanities
European Studies	European Studies	European Studies	Humanities
Film Studies	Film Studies	-	Humanities
French	French	French Studies	Humanities
Gender Studies	Gender Studies	-	Social Sciences
Geography	Geography	Geography	Social Sciences
German	German	German Studies	Humanities
History (and Art History)	History	History	Humanities
International Communication Studies	Modern Languages	Modern Languages (General)	Humanities
Internet Computing	Scarborough Centre for Internet Computing	-	Computing
Italian	Italian	Modern Languages (General)	Humanities
Law	Law School	General Law	Law
Management/Human Resource Management	Management	Management	Business
Marketing/Advertising/Public Relations	Marketing	Marketing	Business
Mathematics	Mathematics	General Mathematics	Mathematics
Medicine	Medical School (Hull) Medical School (York)	Health and Medicine	Health & Medicine
Music	Music	-	Humanities
Nursing and Midwifery	School of Nursing, Social Work and Applied Health Studies	-	Health & Medicine
Performance Studies	Performance, Theatre and Dance	-	Humanities
Philosophy	Philosophy	Philosophy	Humanities
Physics/Applied Physics	Physics	Physics	Physical Sciences
Politics and International Studies	Politics and International Studies	Politics	Social Sciences
Psychology	Psychology	Psychology	Social Sciences
Social Work	Social Work	Social Welfare	Social Sciences
Sociology and Anthropology	Sociology and Anthropology	Sociology; Ethnology, Ethnography, Anthropology	Social Sciences
Spanish	Spanish	Modern Languages (General)	Humanities
Sport and Leisure Management	Sport and Leisure Management	Sport; Leisure	Hospitality, Leisure, Sport & Tourism
Sport Science	Sport Science	Sport	Hospitality, Leisure, Sport & Tourism

Teaching (Primary QTS)	Centre for Educational Studies; Scarborough School of Education	Education	Social Sciences
Theatre Studies	Theatre Studies	-	Humanities
Theology	Theology	Religion & Theology	Humanities
Tourism Management	Business School	Tourism	Hospitality, Leisure, Sport & Tourism

This mapping exercise was a lot more satisfactory. Using a more detailed set of RDN headings meant that there was more equivalence between terms, and it was not usually necessary to map to much broader terms.

However, it became apparent that other issues applied. Firstly, since there are currently some major omissions from the hub headings, such as Music, several important subjects at Hull were not mapped. Some, such as Nursing and Midwifery could not be mapped at the more detailed hub level, since there was no suitable heading available, but could be mapped to the RDN top level (Health & Medicine).

The same requirement to use a mixture of subject heading levels therefore became apparent, despite the availability of more detailed headings. This applied to 'Business' since there is no Hub top level term for business in general. In practice, it may be preferable to use perhaps two terms (eg Business Enterprise and Business, Society and Environment) that are likely to retrieve at least some relevant resources, but for accuracy, no mapping is provided here.

Sample mappings for other institutions

Although this mapping worked well for University of Hull courses, it was felt that it may not work so well for the other institutions in the survey. It was decided that it would be useful to prove this. Sample mappings for each institution follow. Three departments (centres for Belfast Institute) were chosen in each case, except the London Institute, where all the courses for one college were mapped. Like Hull, courses offered by the departments were mapped to Hub top level headings, but also showing the RDN top level heading. The level of course varies according to type of institution (undergraduate, HND, BTEC etc).

University of Bath sample undergraduate course mapping

Three departments were chosen: Architecture and Civil Engineering, Chemical Engineering, and Computer Science.

Some departments at Bath offer a very wide range of different course combinations, as demonstrated below under Chemical Engineering.

University of Bath undergraduate course	Department	Hub top level headings	RDN top level subject
Architecture	Architecture and Civil Engineering	-	-
General Architectural Studies	Architecture and Civil Engineering	-	-
Civil Engineering	Architecture and Civil Engineering	Civil Engineering	Engineering
Civil and Architectural Engineering	Architecture and Civil Engineering	[Civil Engineering]	Engineering
Chemical and Bio Process Engineering	Chemical Engineering	Chemical Engineering; Bioengineering	Engineering
Chemical Engineering	Chemical Engineering	Chemical Engineering	Engineering
Biochemical Engineering	Chemical Engineering	Bioengineering; Chemical Engineering	Engineering
Biochemical Engineering with European Language	Chemical Engineering	Bioengineering; Chemical Engineering; Modern Languages (General)	Engineering
Chemical and Bio Process Engineering and Environmental Management	Chemical Engineering	Chemical Engineering; Bioengineering; Environment	Engineering
Chemical Engineering and Environmental Management	Chemical Engineering	Chemical Engineering; Environment	Engineering
Chemical Engineering with European Language	Chemical Engineering	Chemical Engineering; Modern Languages (General)	Engineering
Environmental Chemical Engineering	Chemical Engineering	Chemical Engineering; Environment	Engineering
Environmental Chemical Engineering with European Language	Chemical Engineering	Chemical Engineering; Environment; Modern Languages (General)	Engineering
Computer Information Systems	Computer Science	Information Systems	Computing
Computer Software Theory	Computer Science	Software	Computing
Computer Science	Computer Science	Computing General	Computing

University of Lincoln sample undergraduate/HND course mapping

The three departments chosen were: Journalism & Humanities, Marketing, and Computing.

University of Lincoln undergraduate degree/HND	Department	Hub top level headings	RDN top level subject
Drama	Journalism & Humanities	-	Humanities
English	Journalism & Humanities	English Studies	Humanities
History	Journalism & Humanities	History	Humanities
Journalism	Journalism & Humanities	-	Humanities

Media Communications	Journalism & Humanities	-	Humanities
Marketing	Marketing	Marketing	Business
PR	Marketing	-	Business
Advertising	Marketing	-	Business
Computing	Computing	Computing General	Computing
Games Computing	Computing	-	Computing
Informatics	Computing	-	Computing
Internet Computing	Computing	-	
Media Technology	Computing		

The Computing Department was chosen to map partly to demonstrate a more 'modern' range of courses, as opposed to those offered by the University of Bath, which are more traditional. There were no obvious mappings available for the more modern courses.

Journalism & Humanities and Marketing were selected as non-traditional university subject areas, although Journalism & Humanities does offer English and History – these were the only two able to be mapped.

Belfast Institute sample course mapping

Given the different structure of colleges of further and higher education, courses offered by three Centres (instead of departments) were mapped: Computing & Software Engineering, Leisure and Sports Studies, and Business Education.

In fact, it was difficult to find Centres where much sensible mapping could be achieved. Some Centres offer a large number of courses with slight variations, and at several different levels, so were too complicated to map, especially since the terms available were too broad to be useful in any case.

Belfast Institute course	Centre	Hub top level headings	RDN top level subject
BTEC HNC in Computing (Fast Track)	Computing & Software Engineering	Computing General	Computing
BTEC HNC in Computing or Software Engineering	Computing & Software Engineering	Computing General	Computing
BTEC HNC in Computing	Computing & Software Engineering	Computing General	Computing
BTEC HNC in Computing with Telecommunications	Computing & Software Engineering	Computing General	Computing
BTEC HNC in Software Engineering	Computing & Software Engineering	Software	Computing
BTEC National Diploma for IT Practitioners (Software Development)	Computing & Software Engineering	Software	Computing
AVCE in Leisure and Recreation (Double Award)	Leisure and Sports Studies	Leisure	Hospitality, Leisure, Sport & Tourism

BTEC First Diploma in Sport	Leisure and Sports Studies	Sport	Hospitality, Leisure, Sport & Tourism
BTEC HNC in Leisure Management (Sport and Recreation)	Leisure and Sports Studies	Leisure; Sport	Hospitality, Leisure, Sport & Tourism
BTEC HNC in Sports Science	Leisure and Sports Studies	Sport	Hospitality, Leisure, Sport & Tourism
BTEC HND in Leisure Management (Sport and Recreation)	Leisure and Sports Studies	Leisure; Sport	Hospitality, Leisure, Sport & Tourism
BTEC HND in Sports Science	Leisure and Sports Studies	Sport	Hospitality, Leisure, Sport & Tourism
BTEC National Certificate in Sport and Exercise Science	Leisure and Sports Studies	Sport	Hospitality, Leisure, Sport & Tourism
AVCE (Double Award) in Business	Business Education	-	Business
AVCE (Single Award) in Business	Business Education	-	Business
AVCE (Single Award) in Retail and Distributive Services	Business Education	Business Enterprise	Business
BA (Hons) Business Studies	Business Education	-	Business
BA (Hons) International Business Studies	Business Education	-	Business
BA (Hons) Retail Management	Business Education	Management	Business
BSc (Hons) Business, Finance and Investment	Business Education	-	Business
BTEC HNC in Business/ Business and Finance/ Business and Marketing/ Business and Personnel/ Business and Retail Management/Business and Management/Business and E- Business	Business Education	-	Business
GNVQ Intermediate in Business	Business Education	-	Business
Institute of Accounting Technicians in Ireland	Business Education	Accounting Profession	Business
Introduction to Business Studies (BTEC National Award in Business)	Business Education	-	

Despite the availability of the more detailed Hub top level terms, the Institute has a very large number of non-traditional courses which could not be mapped. For example, there is a large group of art and design courses. It is likely that many of these could be mapped to ArtIfact, when it becomes fully available.

The same 'Business' issue applied here, as discussed above for University of Hull: there is no general business term at the lower level.

London Institute sample course mapping

Since it was already known that none of the subject areas offered by the London Institute colleges could be mapped to the current RDN, it was decided to map to the preview version of ArtIfact³², which has been made available before the official launch in November 2003 (with the warning that there are likely to be changes). The same level of headings was used as for the other Hubs. Central Saint Martins College of Art & Design was chosen since it offers a wide range of undergraduate courses.

This mapping to Artifact top level headings would not work for some of the other colleges which only offer courses within a specialist arts area eg London College of Fashion, which would require the next level of headings.

Central St Martins College of Art & Design BA Honours	Department	Hub top level headings	RDN top level subject
Acting and Directing	-	Performing Arts	Arts & Creative Industries
Arts and Design	-	Art; Design	Arts & Creative Industries
Ceramic Design	-	Art; Design	Arts & Creative Industries
Fashion	-	Fashion and Beauty	Arts & Creative Industries
Fine Art	-	Art	Arts & Creative Industries
Graphic Design	-	Design	Arts & Creative Industries
Jewellery Design	-	Design; Art	Arts & Creative Industries
Product Design	-	Design	Arts & Creative Industries
Textile Design	-	Design; Art	Arts & Creative Industries
Theatre: Design for Performance	-	Performing Arts	Arts & Creative Industries

LTSN Subject Centres

The Learning and Teaching Support Network is described in Section 1 above. In order to complement the above course mappings, it was felt that it would be useful to try mapping to the Hub top level headings from a different type of resource. The LTSN Subject Centres were chosen for this purpose. This mapping also worked reasonably well.

However one issue to emerge was that because of the level of detail, at times (see LTSN Physical Sciences) it was necessary to map to a number of individual Hub subjects. Different services tend to use a mixture of detail of heading, according to their own focus of interest.

LTSN Subject Centres	RDN Hub top level headings
Art, Design and Communication	-
Bioscience	Biological and biomedical sciences
Built Environment	Environment
Business Management and Accountancy	Management

Economics	Economics
Education	Education
Engineering	Engineering General
English	English Studies
Geography, Earth and Environmental Sciences	General Geography and Environmental Science
Health Sciences and Practice	Health and Medicine
History, Classics and Archaeology	History Classics Archaeology
Hospitality, Leisure, Sport and Tourism	Hospitality Leisure Sport Tourism
Information and Computer Sciences	Computing General Information Systems
Languages, Linguistics and Area Studies	Modern Languages (General) Linguistics
Law	General Law
Materials	Materials Science
Maths, Stats and OR Network	General Mathematics Probability and Statistics
Medicine, Dentistry and Veterinary Medicine	Health and Medicine Animal Health
Performing Arts	-
Philosophical and Religious Studies	Philosophy Religion & Theology
Physical Sciences	Astronomy Chemistry Earth Sciences Materials Science Physics History and Policy
Psychology	Psychology
Sociology, Anthropology and Politics	Sociology Ethnology, Ethnography, Anthropology Politics
Social Policy and Social Work	Sociology Social Welfare

Conclusions

As illustrated above, it could potentially be easier and more satisfactory to map from institutional *courses* (rather than organisational structures), to a more detailed scheme (than RDN headings), such as the JACS principal subjects³³, since structures are too unsystematic. They have grown organically over time and are not generally methodically structured. However JACS is not an information resource, so mapping is

not relevant in the context of this workpackage. This will be examined in workpackage 9.

The option to map from courses however only applies to taught components of the overall university experience. It would not cover research students, staff engaging in research outside the areas they teach and possibly undergraduate students working on essays and final year projects (possibly the most difficult area to cover). There would therefore need to be provision for responding to this key group's requirements. Most departments are likely to record current staff and postgraduate research work on their web pages already. This information could be collated and mapped in the same way. Individuals would have to take responsibility for recording personal research interests.

It is easier to map traditional university organisational structures than more fluid structures of further education colleges, which tend to offer a range of flexible, short and part-time courses.

Collection Level Description (CLD) could in theory solve some issues, since if a standard CLD schema were implemented nationally by all service providers, institutions would only have to map once. However, this is not likely to provide the level of detail required.

Similarly, the RDN top level headings used in this study are so broad, that this level of mapping is likely to be of little practical value to many institutions.

The need to help students in particular to locate and access quality resources is highlighted by a recent study³⁴ which reveals that most students are unaware of the distinctions between material on the Web and peer-reviewed journals, and only four per cent have any concerns about the quality of information available on the web.

Recommendations

- In order to achieve useful recall of results, institutions should focus on mapping from courses, programmes of study, or modules, rather than on the basis of organisational structure.
- The Joint Academic Coding Scheme (JACS), and the manner in which it is already being deployed by institutions, should be explored, in order to gauge its suitability in this area.
- Appropriate provision must be ensured for research students and staff, and means of meeting their needs should be sought.
- If institutions and service providers are to be expected to buy in to any approach, it will need to be comprehensive, documented, and useful. Existing

piloting of the JACS codes within a number of RDN Hubs might usefully be extended, in partnership with a more detailed exploration of the use of these codes within institutional staff and student record systems, and an examination of the extent to which both recall and precision are affected by their use in a search.

Appendix A: Hub top level headings

The complete list of headings as compiled for this study is included below for reference purposes.

In order to carry out the course mapping exercise, the top level headings within each hub were taken from the hub web sites and brought together below to form a single listing. An exception is 'Health and Medicine', which is not subdivided into top level browse terms; therefore the subjects covered by the subject gateways participating in BIOME were substituted instead. 'Life Sciences' is also provided by BIOME via the same service, so is combined here with 'Health and Medicine'. (In contrast to this, SOSIG, which provides 'Business', 'Law' and 'Social Sciences', offers separate home pages for each subject area.)

Hub top level headings

Business
Accounting Profession
Business Enterprise
Business, Society and Environment
Management
Marketing
Computing
Computing Milieux
Hardware
Computer Systems Organization
Software
Data
Theory of Computation
Mathematics of Computing
Information Systems
Computing Methodologies
Computer Applications
Computing General
Engineering
Bioengineering
Chemical Engineering
Civil Engineering
Electrical, Electronic and Computer Engineering
Engineering General
Engineering Design
Environmental Engineering
Manufacturing Engineering
Materials Engineering
Mechanical Engineering and Related Industries

Mining and Mineral Processing
Nanotechnology
Occupational Safety and Health
Petroleum and Offshore Engineering
Aerospace and Defence Engineering
Geography and Environment
Environment
Physical Geography
General Geography and Environmental Science
Techniques and Approaches
Human Geography
Health and Medicine, Life Sciences
Health and Medicine
Animal Health
Biological and biomedical sciences
Natural World
Agriculture, food and forestry
Humanities
American Studies
Archaeology
Classics
History
History & Philosophy of Science
Humanities Computing
Humanities (General)
Linguistics
Manuscript Studies
Museum/Library/Archive
Philosophy
Religion & Theology
Modern Languages (General)
English Studies
French Studies
German Studies
Law
General Law
United Kingdom Law
European Union Law
Other Jurisdictions
International Law
Law by Subject Area
Life Sciences – combined with Health and Medicine, above
Mathematics
General
Algebra
Analysis
Applications to Science and Engineering

Computer and Information Sciences
Mathematics education
Geometry and Topology
History and Foundations of Mathematics
Numerical Analysis and Optimization
Probability and Statistics
Physical Sciences
Astronomy
Chemistry
Earth Sciences
Materials science
Physics
History and Policy
Social Sciences
Business (including Management)
Economics
Education
Environmental Sciences and Issues
Ethnology, Ethnography, Anthropology
European Studies
Geography
Government and Public Administration
Law [NB above]
Philosophy
Politics
Psychology
Social Science General
Social Welfare
Sociology
Statistics
Women's Studies
Hospitality, leisure, sport and tourism
Hospitality
Sport
Leisure
Tourism

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 - ²⁰ <http://www.rdn.ac.uk/> (Last visited 14 June 2003)
 - ²¹ <http://www.hesa.ac.uk/jacs/jacs.htm> (Last visited 24 October 2003)
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