



JISC Resource Discovery Infokit: Interim Report

Project

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Project Title	Resource Discovery Information Kit		
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Partner Institutions			
Project Web URL	http://cdlr.strath.ac.uk/rdinfokit/		
Programme Name (and number)			
Programme Manager	Balviar Notay		

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1. Achievements over the Past 3 Months

The Resource Discovery Infokit project aims to identify and describe a comprehensive range of relevant resources, tools and projects relating to resource discovery, offer views of this content based on a series of key questions and themes, and provide briefing papers on the implementation of resource discovery solutions. The taxonomic framework approach used to build the Infokit will be documented as an example of best practice, and the taxonomies or controlled vocabularies produced will be considered for registration in SKOS. The project will also consider how best to integrate the Infokit into the JISC website and develop a plan for its future maintenance.

Good progress has been made towards the creation of the Infokit during the first three months of the project:

- A preliminary database structure has been identified and implemented to store descriptions of Infokit items and associated access points. The database is implemented in MS Access. Data tables are fully relational and normalised.
- Some 200 items have been identified and recorded in the database. This figure will rise with further analysis, as some of the items are themselves aggregations of relevant Infokit tools. It is likely that the final figure for items identified at the lowest level of operational granularity (ie those that can be utilised in standalone mode) will be 300-400. Some examples of item records are given in an appendix to this report (Exhibit 4).
- Access points for institutions, projects, programmes and technical standards can be stored in separate data tables constructed as look-up tables linked to the main Infokit item table. The appropriate source of content of controlled access points for institutions is HESA, and for projects and programmes is the JISC itself. The project has started to compile controlled access points for technical standards used in Infokit items.
- The project has identified a suitable MS Access database structure for storing a taxonomy for the JISC Information Environment. This structure accommodates preferred and non-preferred terms, and broader/narrow relationships. The project has begun populating the IE taxonomy with preferred and non-preferred terms taken from the JISC website and individual project websites, and is investigating hierarchical relationships. Some examples of this work in progress are given in an appendix to this report (Exhibits 1 and 2).
- As part of this work, the project has produced a concept map for the IE taxonomy. This demonstrates the complexity of the domain and is given in an appendix to this report (Exhibit 5).
- The project has identified the JISC IE architecture diagram as a potential graphic retrieval device for the IE taxonomy and Infokit items. The project has created a proof-of-concept for the use of the JISC IE diagram at <http://cdlr.strath.ac.uk/rdinfokit/iediagram.htm>. The proof-of-concept allows the "Terminology services" and "Metadata registries" components and labels to be clicked by an end-user, resulting in a list of relevant Infokit items.
- The project has identified the NSDL Metadata Registry sandbox (<http://sandbox.metadatarregistry.org/>) as a suitable way of creating SKOS vocabularies for the Infokit. Some initial testing has been carried out and an example of the outputs of this work are given in an appendix to this report (Exhibit 3).

The project has made good progress towards determining the preferred technical solution for the Infokit. The three main approaches can be summarised as follows:

- The Infokit could be limited to a series of static web pages with no underlying database or use of SKOS – this approach offers a quick fix to ensure timely delivery of the project but has serious maintenance and credibility implications – some of the work described above would be redundant.
- The Infokit's content could be compiled using a database, which could then be used to generate static web pages, with controlled vocabularies implemented within the database and possibly registered separately in SKOS – this approach has maintenance implications and is

challenging within the allocated budget and timescale, with the attendant possibility of restricted coverage – it should perhaps be seen as a reasonable compromise.

- The Infokit could be dynamic and database driven – this approach has initial cost and timescale implications but is fully extensible, also it is innovative and would deliver several valuable outputs in addition to the Infokit itself.

The project has also considered whether the Infokit should be integrated within the existing JISC website, which is currently maintained by Eduserv using an in-house content management system, or whether it should be hosted separately and linked to the JISC website.

These investigations have given rise to a number of issues, detailed at Section 3 below, which must be resolved in consultation with the JISC before any firm recommendations can be made or final decisions taken.

2. Project Outputs

A detailed project plan was submitted to the JISC at the end of September 2007. A web template for the project was completed and submitted at the same time.

A basic project homepage has been set up within CDLR website at <http://cdlr.strath.ac.uk/rdinfokit/>. The project plan, interim report and associated documentation will be added within the next fortnight.

All other outputs are due for completion towards the end of the project.

3. Issues

3.1. Change to schedule

Due to a delay in the issue of the letter of award from the JISC, and by agreement with Nike Holmes, all dates given in the project plan have been put back by one month, as follows:

Delivery of interim report	Mid Oct 2007
Publication of Resource Discovery Infokit	End Dec 2007
Delivery of final report	End Dec 2007

So far, the project has been proceeding to plan and good progress has been made in most areas. However, we are now reaching the stage where we need a decision on the technical solution before we can proceed any further. An initial phone meeting to discuss the options has now been scheduled, but we expect that further consultation will be required and anticipate a delay of several weeks before a final decision can be taken by the JISC.

We therefore anticipate a slippage of two or three weeks on the dates given above.

3.2. Issues to be resolved before choosing a technical solution

Our investigations into how the Infokit might be implemented have given rise to a number of issues, which must be resolved before we are in a position to make a firm recommendation on the preferred technical solution. On all these issues, the project team requires information or assistance from the JISC.

The first issue is the availability of information about the content management system used by Eduserv for the JISC website. A series of questions relating to the content management system and its capabilities were put to Eduserv at the inception of the project, with the response that the information requested was substantive enough to be considered as consultancy. This not only makes an initial assessment of the options very difficult but also suggests that options involving the use of the content management system are likely to incur further costs at the implementation stage. Ideally, the project team would at least like to ascertain whether the option to use the content management system is viable in both technical and budgetary terms, without incurring consultancy costs.

A related issue is the availability of various controlled vocabularies and/or data tables currently used within JISC website, for example lists of programmes and projects. Again, these have been requested from Eduserv, but their initial response suggests that the IPR associated with this data is unclear. The project team had expected that such data would be available to JISC-funded projects, particularly those developing components of the JISC website, to ensure consistency and maximise the potential for integration. This would allow projects to focus their efforts on new areas, in this case the development of a taxonomy for the JISC IE, rather than duplicating previous JISC-funded efforts.

If the Infokit is not to be integrated within the content management system, then the project team will need information on where the Infokit will be hosted and who will be responsible for its maintenance, and on the immediate and ongoing cost implications of this option.

It may be helpful to consider whether the JISC are funding or intending to fund any other Infokits or similar web-based resources, and if so, what technical approach they are using and how they will be maintained.

4. Risk Analysis

4.1. Staffing

As mentioned in the project plan, the project has already made changes to the staffing allocation following the departure of the project manager, George MacGregor, at the end of August 2007. Gordon Dunsire is both directing and managing the project, with contributions from senior researchers as required, particularly with regard to drafting of project documentation and day-to-day project management. A junior researcher, Tony Ross, has been assigned to the project on a full time basis, with effect from 10th September.

4.2. Organisational

As anticipated, the technical solution is still undecided. The strategy of using MS Access to collate vocabulary terms and metadata ahead of a full implementation has so far been successful, but a decision is needed on the preferred technical solution before we can proceed much further, and a number of potentially difficult issues remain to be resolved within the JISC before this decision can be taken.

A date has been set for an initial phone meeting between the Programme Manager and the Project Director to discuss the issues raised by the project in more detail and move the decision-making process forward. Nevertheless, it is worth noting that any significant delay at this stage will have serious implications for the scheduling of the project and could potentially lead to problems with allocation of staffing.

4.3. External suppliers

As highlighted in Section 3.2 above, Eduserv have so far proved unwilling to provide the project with the information we require to make fully formed recommendations on the preferred technical solution, choosing to view the provision of information at this level of detail as consultancy. They have taken a similar view on the sharing of vocabularies for JISC programmes and projects, which they already have in their content management system. It seems likely, therefore, that any work by Eduserv to integrate the Infokit with the existing JISC website within the content management system would also be charged as consultancy. The JISC have indicated that any consultancy fees may have to come from within the project budget.

At this stage, we are reluctant to commit project resources to the purchase of detailed technical information or vocabularies from Eduserv. Even without precise costings, it is clear that a fully integrated technical solution is not feasible within the existing project budget, unless a quick fix solution is adopted and all innovative aspects of the project abandoned. Consequently and in order to minimise the substantial risk to the integrity of the project, we have focused on technical solutions which can be implemented independently of Eduserv if necessary.

5. Targets for the Next 2 Months

The first priority is to take a final decision on the preferred technical solution. There are two aspects to the decision, which can be considered independently of each other:

- The first is how and where the Infokit will be implemented or hosted, either integrated into the existing JISC website within the content management system or as a linked website hosted elsewhere. The issues relating to this decision have been outlined above and will be discussed further at the forthcoming meeting between the Programme Manager and the Project Director. It is hoped that a decision will be taken fairly quickly thereafter.
- The second is which approach to use for the implementation of the Infokit. There are three possible approaches:

The quick fix. The resulting website would not be well integrated into the rest of the JISC website, would have a limited shelf life and would be expensive to update or upgrade. *In our view this does not improve substantially on the current situation and represents poor value for money. This approach is not recommended.*

The compromise solution. The problems of integration and maintenance would not be addressed but there would at least be a methodologically sound foundation on which to build future updates or upgrades, in the form of a database and linked data tables for controlled vocabularies, with key vocabularies registered in SKOS. *As stated in the original proposal, this would be difficult to achieve within timescale and budget and in our view would leave the job half done. Nevertheless it is preferable to the first option on the grounds of sustainability and value for money.*

The innovative solution. This will produce not only an integrated and sustainable tool, but also a range of additional outputs, several of them innovative and of considerable interest to the JISC community, including a documented exemplar of best practice in resource discovery, a set of reusable controlled vocabularies, a taxonomic analysis of the JISC IE and a documented case study of the application of SKOS. *This would require some additional resourcing from the JISC but even so it represents excellent value for money. This approach is our recommended option.*

The key differences between the compromise and the innovative approach are as follows:

- The generation of static web pages from the database on the one hand, and the creation of a dynamic database-driven website on the other.
- Both approaches will create the controlled vocabularies (particularly the IE taxonomy) in SKOS. However, the innovative approach will explore and hopefully implement the use of URIs to look up vocabulary terms in SKOS. This will separate the local database content (item level metadata within the Infokit) from the globally applicable access points, resulting in a genuinely innovative and theoretically sound product. It will also allow us to develop separate maintenance strategies for the Infokit and its associated vocabularies, which should be considered as distinct outputs of the project.
- The additional resources required for the innovative approach would also allow us to incorporate a greater level of detail into the IE taxonomy, increasing its applicability and long-term value.
- Similarly, the innovative approach would allow us to maximise the scope of the Infokit, expanding the coverage to include items at higher levels of operational granularity.
- The depth and significance of the documentary outputs would be far greater with the innovative approach. These could include a more detail technical options appraisal (perhaps investigating and reporting on the wider issues raised by the project in relation to the management and further development of the JISC website), as well as the documented exemplar of best practice in resource discovery, the taxonomic analysis of the JISC IE and the documented case study of the application of SKOS mentioned above.

Again, the choice of technical approach will be discussed at the forthcoming meeting between the Programme Manager and the project director. Following a decision on the technical approach, the

project team will finalise details of the workpackage on technical implementation and carry out the implementation accordingly.

In addition to the documentary outputs of the project described above, the project team expect to write three articles, one based on the faceted taxonomic approach used to construct the Infokit, another based on the development of the JISC IE vocabulary, and a third on the project's experiences of expressing controlled vocabularies in SKOS. The mode of publication for these articles will depend on whether the compromise or innovative approach is taken, and the resulting significance of the project's outputs. This activity will take place at the end of the project.

RDInfokit interim report: Appendix

This appendix contains sample outputs from the RD Infokit project.

Exhibit 1 is an extract of a structured thesaurus of controlled terms for describing the operational components of the JISC Information Environment.

The terms have been identified from the IE architecture diagram, other documents about the IE, and JISC project and programme descriptions.

The thesaurus complies with appropriate international standards, and supports hierarchical and equivalence relationships.

Terms have been assigned a numeric notation which reflects the hierarchy to which they belong.

Up to 6 levels of granularity have been identified for some sections of the thesaurus.

The granularity of the thesaurus is linked to the granularity of descriptions of RD Infokit tools (see Exhibit 4): if tools are described at the project level, it is unlikely that the lower level thesaurus terms are required; if tools are described at a more specific level, lower level terms would improve retrieval.

The thesaurus is incomplete with respect to related terms (see-also relationship).

Exhibit 2 is an extract of a database table of non-preferred terms for the JISC Information Environment.

The terms have been identified from IE documentation, JISC project and programme descriptions, and standard methods for thesaurus construction such as inverted entries for phrase terms.

The preferred term from the controlled vocabulary is identified by its notation.

The list of non-preferred terms is incomplete, and may be expanded indefinitely with the addition of spelling variants, acronyms, non-UK Anglophone terms, etc.

Exhibit 3 is the XML file containing the RDF/SKOS markup of a small sample of terms from the IE controlled vocabulary illustrated in Exhibits 1 and 2.

The output is generated from the NSDL Metadata Registry sandbox.

This output can be processed into a declarable namespace by substituting a real base domain for the placeholder used for the sandbox entries (<http://jisc/namespaces/IETerms/>). The processing required is a simple global string replacement, once a real base domain has been established.

The sandbox assigns a running number to each term ("concept") which creates a URI when combined with the base domain. This form of URI reflects current thinking, which is to avoid semantic loading, for example in using the term itself as the unique component of its URI.

Exhibit 4 is an extract from a database table of "tools" (items) identified as suitable for the RD Infokit.

The extract illustrates two main levels of granularity, for the output of a project as a whole, or specific tools generated by a project.

The JISC project and programme name information is taken from related tables.

The extract contains first-pass assignment of technical standards access points. These have not yet been normalised into a separate database table. Further work needs to be done to identify additional access points and assign them to Infokit tools, and to consolidate the list of technical standards.

Exhibit 5 is a digital image of a concept map for a taxonomy for the Information Environment based on analysis of documents from the JISC website.

IE Vocabulary Preferred Terms (Example)

Notation	Term	Notes	Related Terms
1	provision layer services	Layer within the JISC Information Environment that encompasses all resources made available by content providers, including JISC-funded data services, and e-journal providers.	
1.1	JISC funded content providers		
1.2	institutional content providers		
1.2.1	institutional repositories		public repositories; open access initiative
1.2.2	digital repositories		public repositories; open access initiative
1.2.3	open access initiative		
1.3	external content providers		
1.3.1	private publishers		
1.3.2	public repositories		public repositories; digital repositories; institutional repositories
2	fusion layer services	Layer within the JISC Information Environment that contains middleware responsible for combining metadata records for one or more content providers, as a result of cross-searching, harvesting, or alerting.	
2.1	brokers	A structured network service that provides (search) access to a range of other, heterogeneous, local or remote structured network services.	
2.2	aggregators	A structured network service that gathers metadata from a range of other, heterogeneous, local or remote structured network services.	
2.2.1	news-feed aggregation		
2.2.2	metadata harvesting		
2.3	catalogues	A network service that provides access to a collection of human-generated metadata records.	
2.3.1	library catalogues		
2.3.2	online union catalogues		

Notation	Term	Notes	Related Terms
2.3.3	Intute		subject portals
2.4	indexes	A network service that provides access to a machine-generated database of information derived from the content of items in a collection.	
2.4.1	automatic indexes		
2.4.1.1	web search engines		
3	shared infrastructure services	A common set of infrastructural services which provide information through machine-to-machine (m2m) interfaces, and on which other elements of the environment (for example: portals, brokers and aggregators) can draw.	
3.1	service registries	A network service that stores and makes available descriptions of (i.e. metadata about) services and the content of collections made available through those services.	
3.2	institutional profiling services	Services which provide machine-readable information about resolution preferences and local library holdings information; intended to support OpenURL and Resolver services.	
3.2.1	licencing services		
3.3	metadata schema registries	Store, manage and make available descriptions of the metadata schemas in use by other service components.	
3.4	identifier services	A network service that takes metadata about a resource and supplies pointers to services on, or related to, that resource, for example delivery services. In the context of the JISC IE, metadata is passed to the resolver using an OpenURL.	
3.5	terminology services	A structured network service that offers terminology-related services, for example mapping a term from one controlled vocabulary to another or expanding terms within a thesaurus.	
3.5.1	name authority services		
3.6	authentication and authorisation services	Authentication is the process whereby a digital ID is determined to relate to the real life individual who has the rights to use it. Authorisation is the process whereby a digital ID is determined to have the necessary rights to access a given resource.	

Notation	Term	Notes	Related Terms
3.6.01	Athens	Athens is an Eduserv service delivering "authentication, authorisation and distributed user administration services" to UK HE/FE.	
3.6.1	core middleware	The central services that are essential to middleware as a whole. These are: authentication, authorisation, directory services, and identifiers.	
3.6.1.1	identifiers		
3.6.1.1.1	identity providers		
3.6.1.1.1.1	institutional identity providers		
3.6.1.1.1.2	single sign-on services		
3.6.1.2	where are you from services		
3.6.1.3	directory services		
3.6.1.3.1	institutional directory services		
4	presentation layer services	Layer within the JISC Information Environment that encompasses all potential interfaces available to users.	
4.1	institutional portals		
4.1.1	library portals	A library portal extends the functionality offered by the library catalogue, typically including cross-searching of local and remote collections.	
4.2	learning management systems		
4.2.1	virtual learning environments		
4.2.2	virtual research environments		
4.3	media specific portals	A media-specific portal provides a single point of access to resources of a particular type (books, images, geo-spatial data, etc.).	
4.4	openURL link servers	A network service that takes metadata about a resource in the form of an OpenURL and supplies links (pointers) to services on, or related to, that resource, for example delivery services.	

Notation	Term	Notes	Related Terms
4.5	subject portals	A subject portal provides personalised discovery services across multiple, heterogeneous content providers (offering books, journals, Web sites, learning objects, images, etc.) within a specific subject area.	Intute;

IE Vocabulary Non-Preferred Terms (Example)

Synonym	Term	Notation
access management, federated	core middleware	3.6.1
aggregation	aggregators	2.2
alert services	news-feed aggregation	2.2.1
Athens authentication system	Athens	3.6.01
authentication	authentication and authorisation services	3.6
authentication mechanisms, federated	core middleware	3.6.1
authentication services	authentication and authorisation services	3.6
authorisation	authentication and authorisation services	3.6
authorisation services	authentication and authorisation services	3.6
automatic indexing	automatic indexes	2.4.1
catalogue	catalogues	2.3
cataloguing	catalogues	2.3
content	provision layer services	1
content management	provision layer services	1
content management systems	provision layer services	1
content providers	provision layer services	1
content providers, external	external content providers	1.3
content providers, institutional	institutional content providers	1.2
content providers, JISC	JISC funded content providers	1.1
content provision	provision layer services	1
content provision, external	external content providers	1.3
content provision, institutional	institutional content providers	1.2
content provision, JISC	JISC funded content providers	1.1
content, external	external content providers	1.3
content, institutional	institutional content providers	1.2
content, JISC funded	JISC funded content providers	1.1
control services	shared infrastructure services	3

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Synonym	Term	Notation
controlled vocabularies	terminology services	3.5
cross-searching services	fusion layer services	2
e-print archives	institutional repositories	1.2.1
federated access management	core middleware	3.6.1
federated authentication mechanisms	core middleware	3.6.1
federation	core middleware	3.6.1
federation services	core middleware	3.6.1
fusion	fusion layer services	2
fusion services	fusion layer services	2
gateways, subject	subject portals	4.5
Google	web search engines	2.4.1.1
handle	single sign-on services	3.6.1.1.1.2
handle services	single sign-on services	3.6.1.1.1.2
harvesting	metadata harvesting	2.2.2
harvesting (metadata)	metadata harvesting	2.2.2
identifier resolution services	identifier services	3.4
identifier resolver services	identifier services	3.4
identity provider	identity providers	3.6.1.1.1
identity providers, institutional	institutional identity providers	3.6.1.1.1.1
IdP	identity providers	3.6.1.1.1
IESR	service registries	3.1
indexing	indexes	2.4
infrastructural services	shared infrastructure services	3
institutional preference services	institutional profiling services	3.2
interface services	presentation layer services	4
interfaces	presentation layer services	4
JISC IE service registry	service registries	3.1
library catalogue	library catalogues	2.3.1
licensing services	licencing services	3.2.1
managed learning environments	virtual learning environments	4.2.1

Synonym	Term	Notation
name authority files	name authority services	3.5.1
name authority records	name authority services	3.5.1
news feed services	news-feed aggregation	2.2.1
OAI	open access initiative	1.2.3
online public access catalogue	library catalogues	2.3.1
online public access catalogues	library catalogues	2.3.1
online union catalogue	online union catalogues	2.3.2
ontologies	terminology services	3.5
OPAC	library catalogues	2.3.1
OPACs	library catalogues	2.3.1
openURL resolvers	openURL link servers	4.4
portals	presentation layer services	4
portals, institutional	institutional portals	4.1
portals, library	library portals	4.1.1
portals, media specific	media specific portals	4.3
portals, subject	subject portals	4.5
presentation	presentation layer services	4
presentation services	presentation layer services	4
provision	provision layer services	1
provision, content	provision layer services	1
provision, content, external	external content providers	1.3
provision, content, institutional	institutional content providers	1.2
provision, content, JISC	JISC funded content providers	1.1
provision, external	external content providers	1.3
provision, institutional	institutional content providers	1.2
provision, JISC	JISC funded content providers	1.1
publishers, private	private publishers	1.3.1
repositories, digital	digital repositories	1.2.2
repositories, institutional	institutional repositories	1.2.1
repositories, public	public repositories	1.3.2
resolvers	identifier services	3.4

Synonym	Term	Notation
Resource Discovery Network	Intute	2.3.3
RSS	news-feed aggregation	2.2.1
shared infrastructure	shared infrastructure services	3
shared services	shared infrastructure services	3
Shibboleth	core middleware	3.6.1
single sign-on	single sign-on services	3.6.1.1.1.2
subject gateways	subject portals	4.5
thesauri	terminology services	3.5
union catalogue	online union catalogues	2.3.2
union catalogues	online union catalogues	2.3.2
vocabularies, controlled	terminology services	3.5
WAYF	where are you from services	3.6.1.2
WAYF services	where are you from services	3.6.1.2
web crawlers	automatic indexes	2.4.1
web robots	automatic indexes	2.4.1
web spiders	automatic indexes	2.4.1
where are you from	where are you from services	3.6.1.2

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  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:skos="http://www.w3.org/2004/02/skos/core#"
  xmlns:dc="http://purl.org/dc/elements/1.1/">
  - <!-- Scheme: JISC IE Vocabulary -->
= <skos:ConceptScheme rdf:about="http://jisc/namespaces/IETerms">
  <dc:title>JISC IE Vocabulary</dc:title>
  <skos:hasTopConcept rdf:resource="http://jisc/namespaces/IETerms/1001" />
  </skos:ConceptScheme>
  - <!-- Concept: shared infrastructure services -->
= <skos:Concept rdf:about="http://jisc/namespaces/IETerms/1001">
  <skos:inScheme rdf:resource="http://jisc/namespaces/IETerms" />
  <skos:prefLabel>shared infrastructure services</skos:prefLabel>
  <skos:narrower rdf:resource="http://jisc/namespaces/IETerms/1003" />
  <skos:narrower rdf:resource="http://jisc/namespaces/IETerms/1002" />
  </skos:Concept>
  - <!-- Concept: metadata schema registries -->
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  <skos:prefLabel>metadata schema registries</skos:prefLabel>
  <skos:broader rdf:resource="http://jisc/namespaces/IETerms/1001" />
  </skos:Concept>
  - <!-- Concept: terminology services -->
= <skos:Concept rdf:about="http://jisc/namespaces/IETerms/1003">
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  <skos:prefLabel>terminology services</skos:prefLabel>
  <skos:broader rdf:resource="http://jisc/namespaces/IETerms/1001" />
  <skos:altLabel>controlled vocabularies</skos:altLabel>
  <skos:definition>A structured network service that offers terminology-related
    services, for example mapping a term from one controlled vocabulary to
    another or expanding terms within a thesaurus.</skos:definition>
  </skos:Concept>
</rdf:RDF>
```

Item Report (Example)

Item.Name	ANGEL Tool2
URL	http://www.angel.ac.uk/current-
Summary	<p>ANGEL - User Manager, handles users of the Angel system.</p> <p>It allows users to log in to the system, provides authentication of the user and delivers authorisation details to the user thereby allowing them the rights to access the appropriate resources.</p> <p>Each Angel system is intended to be an individual service to users of a particular institution. The UM enables easier portability to further institutions that wish to adopt it as a solution. The Angel User Manager (UM) queries one or more institutional services to obtain user verification and directory data, presenting it in a unified format. This allows the main Angel software to treat any local user information in the same way, disguising all the technical and organisational idiosyncrasies.</p> <p>The main advantage to end-users of this approach is that once logged in to the Angel system there is no further need for them to enter username/password combinations to access resources controlled by Angel, such as libraries, content repositories and so on. They don't have to learn (or write down, insecurely) yet another password for each new service that the institution creates or connects to.</p>
Standards	
Project.Name	ANGEL: Authenticated Networked Guided Environment
Programme.Name	Learning and teaching (5/99) programme
Item.Name	ANGEL Tool3
URL	http://www.angel.ac.uk/current-
Summary	<p>DELIVER Smart Link Finder: The DELIVER Smart Link Finder is a tool for building and maintaining simple reading lists. It includes a Universal Harvesting Tool (UHT) to allow users to simply and quickly add resource to URLs to course pages, and for these URLs to be supported via a central database. In order to allow the UHT tool to use SmartLinks it must be configured to communicate with its own UHT database and an instance of the Angel Resource Manager.</p>
Standards	VLE+LMS
Project.Name	ANGEL: Authenticated Networked Guided Environment
Programme.Name	Learning and teaching (5/99) programme

Item.Name	ARCHES Final
URL	http://www.jisc.ac.uk/uploaded
Summary	Antiquity Related Collections Harnessed for Educationa. ARCHES aims to support and link institutions, departments, courses and modules as they introduce, evaluate and disseminate exemplary, transformative and innovative pedagogy through re-purposing new and existing collections of digital resources pertaining to ancient Greece and Rome.
Standards	
Project.Name	ARCHES - Antiquity Related Collections Harnessed for
Programme.Name	Exchange for learning (X4L) programme
Item.Name	ARCHES Tool
URL	
Summary	Online database
Standards	
Project.Name	ARCHES - Antiquity Related Collections Harnessed for
Programme.Name	Exchange for learning (X4L) programme
Item.Name	ASK: Accessing and Storing Knowledge
URL	http://ask.oucs.ox.ac.uk/
Summary	The ASK project will develop a suite of open source software artefacts that support learners, researchers and teachers in securely accessing and sharing learning objects. The project will implement a pilot design pertaining to a repository reference model based on the JISC E-Learning Framework (ELF) . The project will implement services that fall within the ELF i.e. metadata management, content management, authentication, and authorisation (Shibboleth) components. The overall goal of the project is to build interoperability between user agents (such as VLEs and Activity Management systems) and information systems normally under the management of library departments. The ASK project is a direct response to the project partners institutional needs to integrate library and learning services.
Standards	ELF
Project.Name	ASK: Accessing and Storing Knowledge
Programme.Name	Digital repositories programme 2005-7

Item.Name	CATS Final Report
URL	http://www.jisc.ac.uk/media/do
Summary	<p>The overall aim of the project is to create a toolkit of loosely-coupled web services which support the various tasks inherent to automated assessment construction e.g. searching for, retrieving and aggregating assessment items held in multiple item banks. The outputs of the project will be disseminated to users via the CETIS Assessment SIG (Special Interest Group). In addition, the project will undertake a consultation exercise with several domain practitioners involved in creating assessments from item banks. This task will give an overview of current practice, as well as indicating future functionality which CATS could support.</p>
Standards	SPAID+Discovery Plus
Project.Name	CATS: Constructing Assessments using Tools and Services
Programme.Name	e-Learning framework and tools programme
Item.Name	CC-Interop (Copac and CLUMPS interoperability project) Final
URL	http://ccinterop.cdrl.strath.ac.uk
Summary	<p>Copac and CLUMPS interoperability project. CC-interop was a JISC funded collaborative project, involving the M25 Systems Team, CDLR, MIMAS and RIDING and built on the expertise acquired in recent years in the area of union catalogues, both physical and virtual, aiming to take the JISC vision of the Information Environment ever closer.</p> <p>Beginning May 2002 and finishing in June 2004, CC-interop was a two year project which was split into three work packages: Work Package A was the responsibility of M25 Systems Team based at LSE and MIMAS, which hosts the established JISC service COPAC. It included:</p> <ul style="list-style-type: none">Bullet working co-operatively to test the feasibility of inter-linking between union catalogues, both physical and virtualBullet investigating various ways of getting a virtual union catalogue to be co-searchable with a physical union catalogue without having to re-key the searchBullet testing further some of the findings of the UKNUC Feasibility Study Report in relation to comparative speed of searching, de-duplication and ranking of records, and precision of results sets between COPAC and the clumps
Standards	Copac+CLUMPS
Project.Name	Copac and CLUMPS interoperability project (CC-Interop)
Programme.Name	Digital library infrastructure programme

Concept map for an Information Environment taxonomy

