

University of Abertay Dundee

**Submission for the JISC infoNet Award for Innovation in
Records & Information Management**

***“Applying information retrieval techniques and philosophies
allied to records management to support taxonomy and
information architecture development”***

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Overview

In 2005, the University of Abertay Dundee ¹ began the process of implementing a portal, replacing the University's intranet. The necessity of taxonomy implementation to underpin portal deployment was impressed upon the project team, at an early stage, presenting a series of challenges. At the time, colleagues were unfamiliar with the notion of taxonomy, as an information management tool.

Initially there was a belief that taxonomy development fell within the domain of the IT professional, and that external consultancy would be required to bridge this particular skills gap. However, following a period of investigation, it was suggested that taxonomy development fell within the sphere of the information professional, with librarians identified as being best placed to take a lead role. While information retrieval techniques allied to librarianship played a significant role in reaching an understanding of, and contextualising taxonomy development, one of the key solutions that emerged emanated from classification philosophy allied to the records management profession, and not only the librarianship arena as initially envisaged.

This paper describes how information retrieval techniques allied to records management traditions were deployed (during 2006/07), making a significant contribution to the development of and deployment of a portal to replace an existing organisational intranet.

Original drivers behind the project

Improving the organisation and retrieval of information, resources and services

The following defence of classifying records summarised the essence of the problems facing users' where difficulties were encountered in effectively engaging with the University's intranet.

"In many organisations... records systems [and intranets] are poorly structured. They may be based on administrative arrangements... on subject content or on some combination of the two. It is often difficult or impossible to gain contextual information... Each business unit may have its own system, with no consistency across the organization" (Shepherd and Yeo, 2003, p.74-75)

The problems concerning information management were manifested through:

- A lack of consistency in the organisation and presentation of materials, resources and services. A range of approaches were taken to organising information, which varied depending on the department concerned
- The search experience was poor. Specifically, no metadata was available to help improve the precision of search, or to provided indexes as additional access points. Users were reliant upon a full-text search, which frequently burdened students and staff with large volume of results

These fallings introduced a number of barriers, which often hampered the ability of users' to engage with the University, particularly where the intranet was used as a resource (indeed often a first point of contact) for sourcing information and advice. It

¹ Hereafter referred to as UAD, Abertay or the University.

was essential that the difficulties encountered in locating and retrieving information were not replicated in the intranet's replacement.

Project aims

To improve information management within the Portal, the University required:

- A methodology, from which a taxonomy, or underlying structure could be created to support the organisation of information and retrieval via a pre-determined navigable structure, and
- Processes for consistently indexing materials to support retrieval via search.

Hypothesis: applying records management techniques allied to information retrieval to support taxonomy development

The task and the problem

The initial stage of taxonomy development focused on developing a means of organising information, (essentially a hierarchical structure) within which users' would navigate pre-determined pathways to identify and retrieve content. This was referred to as a *primary taxonomy*, drawing upon terminology used by Oracle consultancy. Despite there being an understanding of the task i.e. applying pre-coordinated classification techniques to organise information within defined structure, a significant unknown remained. What order of division (i.e. citation order) was to be applied to create the hierarchy or classification, which in turn would produce a logical grouping of content within the Portal? (Milne, 2007)

Moving from the rhetoric of taxonomy (i.e. understanding the basic principles) to substance, i.e. determining and implementing the underlying classification approach necessary to create a navigable structure, and accompanying metadata elements to support indexing and search, was a significant challenge.

The subject and/or administrative approach?

Subject based approaches to organising information are commonly applied. However, this approach did not automatically lend itself to organising the rich array of materials that required to be represented within the Portal. Neither was the grouping of content based on the originating administrative function deemed appropriate. An alternative approach was sought. As illustrated in the previously cited quotation from Shepherd and Yeo (2003, pp.74-75) organising materials from a contextual perspective could prove a viable alternative to *subject* and *administrative* approaches.

Records management approaches to classification: classifying records and documenting their content

Materials discussing the classification of records were consulted, notably the National Archives of Australia (2003), Shepherd & Yeo (2003), and Morelli (2005). Reflecting on the discussions of classification techniques applied by the records management profession strongly indicated that it was likely that a systematic classification (i.e citation order) based on:

Business Classification Scheme	Records Classification Scheme
<ul style="list-style-type: none">• Function<ul style="list-style-type: none">○ Activity<ul style="list-style-type: none">▪ Transaction	<ul style="list-style-type: none">• Function<ul style="list-style-type: none">○ Activity<ul style="list-style-type: none">▪ Topic<ul style="list-style-type: none">• Sub-topic

as applied to create business classification and records classification schemes (National Archives of Australia, 2003, pp.18-21) could provide an appropriate model for taxonomy development, where organising content by subject and/or administrative approaches proved unworkable.

The hypothesis – applying contextual classification to develop taxonomies

Classifying by *Function*, *Activity* and *Task* could:

- Provide a stable, repeatable method of organising materials, creating a suitable navigable structure by virtue of the citation order utilised
- Create a holistic view of events by virtue of the contextual grouping produced as a result of the classification i.e. drawing upon “*how records are classified and organized to ensure that contextual information is available and users’ needs are met.*” (Shepherd and Yeo, 2003, p.72)

Demonstrating the potential application and benefits of contextual classification: fixed term contracts

In exploring with colleagues the merits of applying *contextual classification* to organise materials within a portal, the following scenario was used:

- Many recruiting managers were previously not aware of changes to employment law concerning the use of fixed-term contracts²
- A lack of awareness in this area was explained by the artificial treatment/placement of information within an employment-legislation section of the University's intranet. A number of recruiting managers felt that *employment legislation* was not of direct relevance to their daily work, and as such they did not associate with the term. Where information was required on this area they would normally seek advice by contacting human resource services
- Contextually information on fixed-term contracts exists to inform, guide and protect the University from entering into illegal conditions of employment
- Therefore information on the University's approach to fixed-term employment should be made available as part of the recruitment process

Note, the terminology used in the citation order deviated slightly from that used by the National Archives of Australia (2003) There was a small element of confusion concerning the terms "*topic*" and "*sub-topic*." These terms were substituted by **#Task** and **#Sub-task** respectively

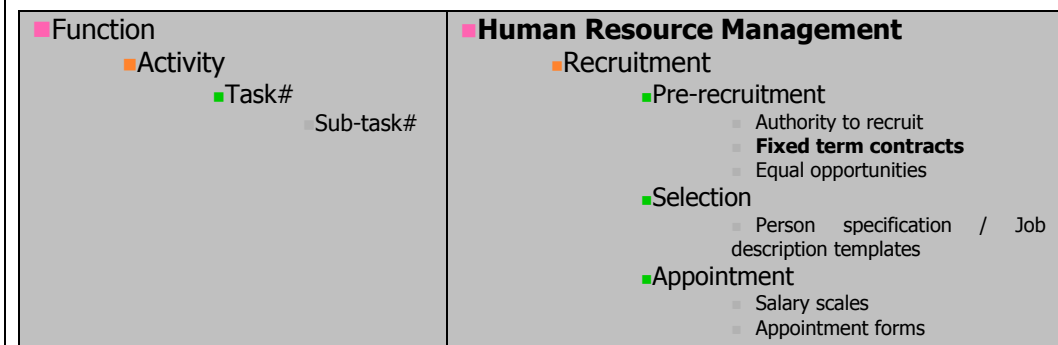


Figure 1: Exploring the application of *contextual classification*

² Specifically The Fixed-term Employees (Prevention of Less Favourable Treatment) Regulations 2002, Statutory Instrument 2002 No. 2034.

Exploring the stability and flexibility of contextual classification

Securing stability in the portal's underlying information architecture was identified as a critical requirement. It was felt important to shield users' from substantive change, providing a relatively consistent on-line experience. The inherent stability of functional classification was discussed and presented as an advantage, where the business *functions* and *activities* of the University (e.g. teaching, learning and research) were likely to remain constant. Furthermore, the hospitality offered by functional classification (i.e. the ability to add new topics to existing activities) was illustrative of the flexibility to incorporate change, without necessarily requiring significant structural change, or re-design. To illustrate how flexibility could be incorporated into the taxonomy a further scenario was offered:

- The **function** of managing and developing people is likely to remain a constant feature in providing education and research
- The range of **activities** allied to the **function** of managing and developing people (human resources) is likely to remain stable. These include recruitment, pay and reward, training and development etc.
- Most universities in the UK during 2004-2006 had to address the issue of equal pay and harmonization, being required to undergo the process of job evaluation
- Job evaluation can be considered a new **task**, that fits within the existing framework: the **function** being 'human resource management', allied to the **activity** of pay and reward
- Thus in terms of Web site design, a contextual arrangement centred on **function** and **activity** is not likely to necessitate substantial re-design where new **task(s)** are added into the existing architecture/structure

Figure 2: Exploring the stability and flexibility of *contextual classification*

Taxonomy pilot: the “Quality Guide”

One of the first areas to be developed within the University Portal, was the “Quality Guide.” This was the University’s on-line depository that provided access to documentation associated with quality enhancement and assurance processes. The “Quality Guide” was not perfect. Materials were presented to users alphabetically, introducing a number of problems. This arrangement in many instances relied upon a familiarity with document names and University terminology to locate and retrieve items. Related materials were scattered, by virtue of document names e.g. mitigating circumstances provides information on support available where students are unable to meet assessment deadlines. These guidelines are listed separately from other items pertaining to assessment. In addition, materials published on the quality guide were not indexed. The absence of metadata created additional barriers to effective search.



Figure 3: The Quality Guide

Applying contextual classification to develop a taxonomy

Step 1: review of DIRKS Step B – analysis of business activity

The following materials were reviewed to further understanding i.e. develop greater clarity in the various classification levels:

Source	Notes
National Archives of Australia (2003). <i>Overview of classification tools for records management.</i>	<ul style="list-style-type: none"> • Advanced understanding of functional classification • Section 3 “<i>Explaining classification levels</i>” guided the development of the citation order function, activity, task, sub-task <ul style="list-style-type: none"> ○ Note, the terms “<i>topic</i>” and “<i>sub-topic</i>” as presented in the text were replaced by “<i>task</i>” and “<i>sub-task</i>” respectively, as colleagues resonated with these terms more readily • Reinforced the value of undertaking Step B of the DIRKS methodology (specifically B.4.2), to identify and develop functions and activities i.e. “<i>defining the boundaries</i>”
National Archives of Australia (2000). <i>Managing business information: DIRKS.</i>	<ul style="list-style-type: none"> • Step B of the methodology “<i>Analysis of business activity</i>” was reviewed, with section B.4 undertaken to identify activities and related tasks (or “<i>transactions</i>” if applying DIRKS terminology)

Figure 4: Reference sources - clarifying functional classification

Step 2: defining the functional area “quality enhancement and assurance”

It was necessary to define quality assurance/enhancement. The Quality Guide evolved accidentally where ‘*mission creep*’ allowed for the introduction of content that had no direct relevance to the University’s quality mechanisms. The following definition provided a framework for regulating the range of materials to be published within the quality function

[Abertay Knowledge] “is the information source for the regulations, policies, procedures and guidelines that are employed by the University to ensure that academic standards are maintained, to ensure a high quality student learning experience, and good corporate governance”

Figure 5: Defining the quality enhancement/assurance function

Step 3: identifying activities

The JISC function activity model for Higher Education was consulted. Having access to a sector specific business classification scheme proved useful. This eliminated the requirement to conduct a detailed information audit. The quality activities identified provided a solid foundation. Following a period of analysis and discussion, the following activities were agreed:

- | |
|--|
| <ul style="list-style-type: none"> • University governance • Planning and reporting • Programme and subject development and review • Teaching, learning and assessment • Student administration and support • Research • Commercialisation and knowledge transfer • Information and knowledge management • Human resource management • Estates and campus, infrastructure and resource |
|--|

Figure 6: Activities identified as being allied to function “Quality enhancement/assurance”

Step 4: identifying tasks, developing a taxonomy schedule

Each activity was reviewed to identify allied tasks. This was largely achieved through interviewing colleagues who had an intimate knowledge of the University’s quality processes. Reference was also made to the definitions of function, activity, topic and sub-topic introduced at **Step 1** to ensure clarity and consistency in the analysis.

A draft taxonomy schedule was produced, and refined following a mapping exercise where existing content contained within the *Quality Guide* was mapped onto the taxonomy structure.

Function: Quality Enhancement/Assurance
Activity: Teaching, Learning and Assessment
<input type="checkbox"/> Tasks (place here: Institutional strategies, policy and procedures for developing and enhancing teaching & learning and employability)
<input type="checkbox"/> Assessment: Academic regulations and associated procedures <ul style="list-style-type: none"> ○ Mitigating circumstances ○ Examination rules & regulations ○ Academic appeals ○ Academic deceit ○ Code of assessment principles ○ Assessment archiving <input type="checkbox"/> Timetables / Academic calendar <input type="checkbox"/> Enhancing teaching & learning <ul style="list-style-type: none"> ○ Teaching fabric

Figure 7: Extracts from the quality enhancement/assurance taxonomy schedule

Step 5: development of metadata, an elementary thesaurusfacet

One of the by-products of the classification structure was a controlled vocabulary. Metadata for search was partly derived from the classification structure, where the language produced for [Activity] and [Task] elements were used to index materials to support retrieval.

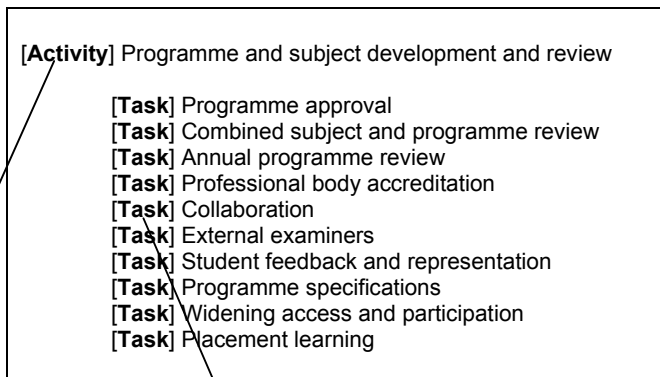


Figure 8 Metadata derived from classification

Created:	28-NOV-06
Last Modified:	28-NOV-06
File Name:	EXTRERNAL-EXAMINERS-HANDBOOK-APPROVED-V1-0.DOC
Display Name:	External examiners handbook
Document Creator 1:	External Task Group Leader
Document Creator 2:	<None>
Approved By:	Quality Assurance Committee
Approval Date:	14-SEP-2006
Review Date:	30-JUN-2007
Version:	Approved 1.0
Document Type:	handbook/manual
Activity:	Programme and subject development and review
Task:	External examiners
Retention Schedule:	<None>
Document Master:	\\Uad.ac.uk\dfs\Secretariat\Abertay-Knowledge\Programme-and-Subject-Development-and-Review

Figure 9 Metadata allocated to a specific object

<p>[Activity] University governance</p> <ul style="list-style-type: none"> [Task] University legal framework [Task] Court [Task] Senate [Task] Operational management group [Task] Quality framework [Task] Legislative compliance <p>[Activity] Planning and reporting</p> <ul style="list-style-type: none"> [Task] University mission [Task] Strategic plans [Task] Planning and reporting processes [Task] Plans and reports [Task] Portfolio management <p>[Activity] Programme/subject development and review</p> <ul style="list-style-type: none"> [Task] Programme approval [Task] Combined subject and programme review [Task] Annual programme review [Task] Professional body accreditation [Task] Collaboration [Task] External examiners [Task] Student feedback and representation [Task] Programme specifications [Task] Widening access and participation [Task] Placement learning 	<p>[Activity] Teaching, learning and assessment</p> <ul style="list-style-type: none"> [Task] Assessment [Task] Timetables and academic calendar [Task] Enhancing teaching and learning [Task] Teaching space <p>[Activity] Student administration and support</p> <ul style="list-style-type: none"> [Task] Recruitment [Task] Admission [Task] Registration and fees [Task] Student induction [Task] Student records [Task] Student complaints [Task] Student discipline [Task] Student customer management [Task] Student welfare [Task] Student withdrawal [Task] Special needs [Task] Graduation [Task] Financial support <p>[Activity] Research</p> <ul style="list-style-type: none"> [Task] Strategy, policy and procedures [Task] Research ethics [Task] Research quality, external measurement [Task] Research funding [Task] Research supervision 	<p>[Activity] Commercialisation and knowledge transfer</p> <ul style="list-style-type: none"> [Task] Strategy, policy and procedures [Task] Register of commercial activities [Task] Plans and reviews <p>[Activity] Information and knowledge management</p> <ul style="list-style-type: none"> [Task] Strategy [Task] Policy, guidelines and procedures: legislative compliance [Task] Corporate information management <p>[Activity] Human resource management</p> <ul style="list-style-type: none"> [Task] Strategy, policy and procedures [Task] Organisational development and training <p>[Activity] Estates and campus, infrastructure and resources</p> <ul style="list-style-type: none"> [Task] Strategy, policy and procedures
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Figure 10: Metadata derived from the taxonomy at Activity and Task levels

Step 6: implementing the taxonomy

The taxonomy structure was implemented within the Oracle platform, into which a total of 169 items were uploaded, and the relevant metadata added.

Contextual classification applied

Demonstrating the navigable structure and the holistic view

UNIVERSITY of ABERTAY DUNDEE Advanced Search Home www

Abertay Knowledge > Student Administration and Support

Student Administration and Support

Sub Sections

- [Recruitment](#)
Includes Procedures for the Recruitment of Students
- [Admission](#)
Includes the University Admissions Policy and Procedures for the Admission of Students
- [Registration fees](#)
Includes Procedures for the Enrolment and Registration of Students
- [Student induction](#)
Includes information on the induction of undergraduate, postgraduate and research students
- [Student records](#)
- [Student complaints](#)
Includes the Student Complaints Procedure
- [Student discipline](#)
Includes the Student Disciplinary Code of Practice
- [Student welfare](#)
Includes the Student Charter and Mental Well Being Policy for Students

Figure 11 Abertay Knowledge: view of tasks allied to the activity “Student administration and support”

UNIVERSITY of ABERTAY DUNDEE Advanced Search Home www

Abertay Knowledge > Student Administration and Support > Admission

Admission

Includes the University Admissions Policy and Procedures for the Admission of Students

Documents

- [Admissions policy](#)
- [Procedures for the admission of students](#)
- [Policy on use of disclosure Scotland: information for students](#)
- [Procedures for the accreditation of prior learning](#)
- [Articulation procedure](#)
- [Articulation procedure: non UK standard](#)

Sub Sections

- [Recognition of Prior Learning \(RPL\)](#)

Figure 12 Abertay Knowledge: View of the materials allied to the task “Admission”

Function: NB *Abertay Knowledge* was the name selected to represent the quality function

Activity: *Student Administration and Support* is one of the 10 *Activities* identified, that underpin the quality enhancement/assurance *Function*

Task: *Admission* was identified as a task, which formed part of the *Activity* student administration and support. Seven items were indexed under this particular task

Figures 11-12 illustrate the holistic overview created by the application of a citation order: function, activity, and task, which determined the (contextual) grouping of materials. Figure 11 illustrates the range of *Tasks* allied with the *Activity* “Student Administration and Support”. The complete range of materials produced to support the *Task* of “Admission” is presented in Figure 12. The alphabetic arrangement could not guarantee that users’ would be presented with a holistic view of materials. Although users can browse alphabetic lists, the holistic (contextual) overview provided at the *Activity* and *Task* levels provided an alternative and important means of engaging and exploring materials on-line.

Additional access points (pre-coordinated) indexes

Indexing materials by *Function*, *Activity*, and *Task*, provides a platform for creating additional a-z indexes beyond a title index. Users’ can now be presented with alphabetic views of materials based on the contextual indexing.

Creating additional views via search (post co-ordination)

Users’ are not restricted to browsing the navigable structure to achieve a holistic view of activities and/or tasks. As the metadata contains elements to index *Function*, *Activity* and *Task*, users have the ability to create their own views of materials where they do not wish to engage with the navigable structure provided. Currently, these additional access points are facilitated through search.

The screenshot shows a search interface with the following elements:

- Search Input:** A text box containing "Student administration and support: Admission" and a "Search" button.
- Find results that:** A dropdown menu set to "contain all of the terms".
- Search In:**
 - Page Groups:** A text box containing "University".
 - Page:** A text box containing "Abertay Knowledge".
 - Include Sub-pages:** A checked checkbox.
- Filter By:**
 - Match All Of The Following:** A selected radio button.
 - Match Any Of The Following:** An unselected radio button.
 - Perspective:** A dropdown menu set to "Match All".
 - Include Sub-perspectives:** An unchecked checkbox.
 - Category:** A dropdown menu set to "All".
 - Activity Detail:** A text box containing "Activity Detail".
 - Contains all:** A dropdown menu set to "Contains all".
 - Student administration an:** A text box containing "Student administration an".

Figure 13: Search

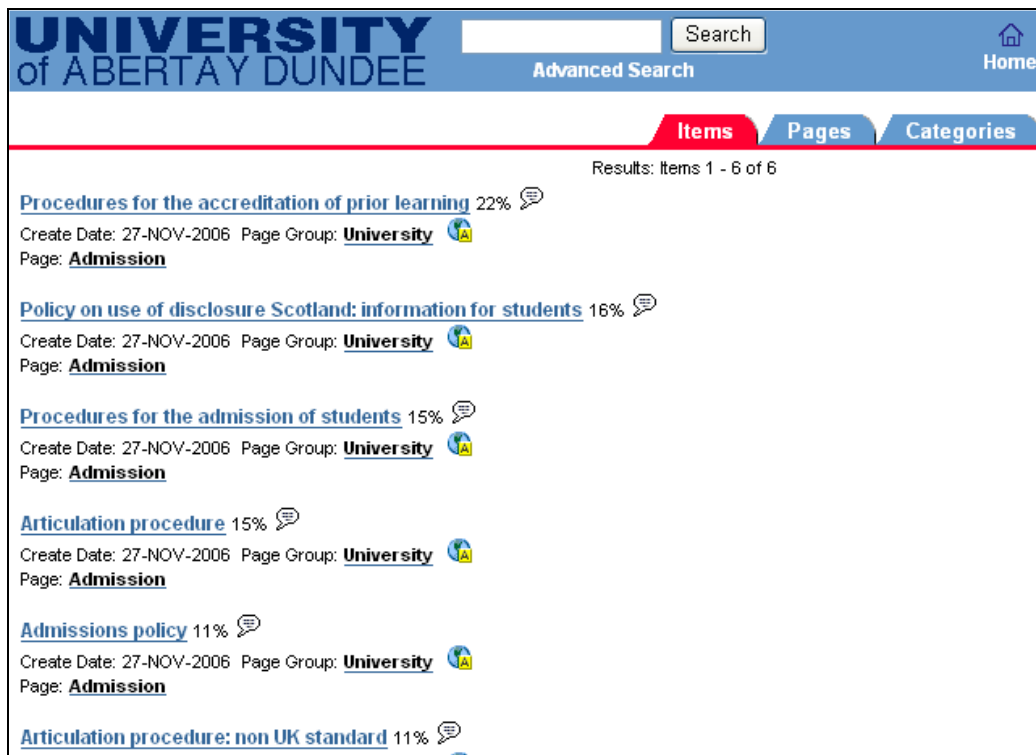


Figure 14: Viewing *Tasks* via search

Final project deliverables

Contextual classification: a methodology for taxonomy and information architecture development

The application of information retrieval techniques, with a particular focus on those allied to records management (i.e. classification to preserve context) contributed directly to the creation of:

- A system of organisation
- Navigable structure
- Controlled vocabulary and metadata capable of enhancing the relevancy and precision of information retrieved via search, while also providing a platform to support the generation of additional indexes

Here, records management was instrumental in providing the underlying philosophy that directed the development of a taxonomy, and wider information architecture. As discussed earlier, taxonomy development was identified as a core element, necessary to improve information management within the University Portal, and by extension user satisfaction.

Contextual classification: a stable repeatable model for taxonomy and information architecture development

Abertay Knowledge was launched in January 2007. Since this time, the underlying taxonomical structure has not changed significantly. No changes have been necessary at the *Activity* level. New tasks have been added, and some have been removed. This provides evidence of both the stability and flexibility offered by working with materials at a *Function and Activity level* with the flexibility to accommodate change via *Tasks* as initially offered in the hypothesis.

This model of information management is also repeatable, in terms of developing other taxonomies. During the spring and summer of 2007, taxonomies for the functional areas “developing and managing the University Estate” and “managing and developing people” were produced. The allied structures and metadata for both these taxonomies are now being added to the University Portal.

Enhancement-led institutional review (ELIR)

ELIR, is a quality review process, which has been undertaken throughout the Scottish HE sector. During the University’s ELIR review, the contextual classification methodology applied to develop *Abertay Knowledge* was deemed important and submitted as part of the University’s quality audit, where it featured as part of a case-study illustrating the work undertaken to improve information access within the portal (Quality Assurance Agency for Higher Education, 2007).

Taxonomy development: a new strategic opportunity for records managers?

At Abertay, the *Freedom of Information (Scotland) Act 2002* was the prime catalyst that prompted the implementation of a professional records management function. Understandably, where legislation prompts the introduction of new business functions and processes, by association such changes can be viewed as bureaucratic, diverting valuable resource from core business.

At UAD, demonstrating the application of records management philosophy and techniques associated with information retrieval to drive and support taxonomy implementation has been a significant opportunity. Aligning records management techniques with improving a core area of the University’s business (i.e. improving access to information for students and staff within its Portal) has helped to both raise the profile and significance of records management.

“Working to apply record management techniques within portal and/or intranet developments has the advantage of bringing the records management discipline out of the back office closer to the customer, where improved methods of information organisation and retrieval are demonstrable in the enhancement of the student/staff experience...Here the taxonomy [and wider information architecture e.g. metadata etc. created beyond the physical structure] acts as an interface between the user and the corporate information, resources and services that the University provides and maintains to support teaching and learning...Utilising records management techniques to influence and direct the development of ‘substantive’ business functions is likely to ensure that records management is sustained after the impact of Freedom of information has dissipated.” (Milne, 2007, p.14)

Prior to the launch of *Abertay Knowledge*, the University Senate (December 2006) commended the work of the project team, recognising the level of improvement made through the pilot. Significantly, Senate also acknowledged the utility of applying the principles of functional classification as a model to develop additional taxonomies to improve information management and retrieval throughout the Portal.

Conclusions

This case study is offered as an innovative project that has applied records management philosophies and techniques allied to information retrieval to meet an organisational requirement. The project also applied records management principles to improve the performance of the University portal (as a new and emerging technology). This initiative has also helped the University both in meeting external quality requirements (ELIR review) and in improving access to materials.

Information retrieval is a core element of information architecture and taxonomy development. As the importance of improving the management of and access to information increases with the emergence of the knowledge economy, increasingly organisations are investing in information retrieval solutions. The emergence of the information architect supports this view. Hopefully, this case study can stimulate further debate on the role of the information profession as a key contributor to information architecture and information retrieval solutions. In particular, it is hoped that the unique approaches to organising and retrieving information allied to contextual classification, can increasingly be viewed and used as workable solutions in developing on-line environments.

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