Developing information architectures through records management classification techniques.

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Abstract

Context and purpose of the work: This work draws attention to information retrieval philosophies and techniques allied to the records management profession, advocating a wider professional consideration of a functional approach to information management, in this instance in the development of information architectures.

Methodology: This paper draws from a hypothesis originally presented by the author (Milne, 2007a) that advocated a viewpoint whereby the application of records management techniques traditionally applied to develop business classification schemes was offered as an additional solution to organising information resources and services (within a university intranet), where earlier approaches notably subject and administrative based arrangements were found to be lacking.

The hypothesis was tested via work-based action learning and is presented here as an extended case study. This paper also draws upon evidence submitted to the Joint Information Systems Committee in support of the University of Abertay Dundee's application for consideration of the JISC award for innovation in records and information management (Milne, 2007b).

Findings: The original hypothesis has been tested in the workplace. Information retrieval techniques allied to records management (functional classification) were the main influence in the development of pre and post-coordinate information retrieval systems to support a wider information architecture, where the subject approach was found to be lacking. Their use within the workplace has since been extended.

Originality/value: The development of information retrieval as a discipline should include a wider consideration of functional classification, as this alternative to the subject approach is largely ignored in mainstream IR works.

1. Background

In 2005 the University of Abertay Dundee [1] began the process of implementing a portal, primarily as a replacement for the University's intranet. Following a feasibility study the Oracle platform *Application Server 9iAS* was selected. During the project's initiation phase, an unknown (yet fundamental) quantity was introduced to the project team by Oracle consultancy i.e. the necessity of developing and implementing a *taxonomy* to underpin the portal's development. At the time colleagues on the project team were unfamiliar with the notion of taxonomy as an information retrieval and management framework. The extent to which, was perhaps best demonstrated through the initial belief that taxonomy development fell solely within the domain of the IT professional, and that external consultancy would be required to bridge this particular knowledge and skills gap.

Following a period of investigation, it quickly became apparent that the knowledge and skills of information professionals was central to taxonomy development. However, an unintentionally narrow view of the role of the information professional concerning taxonomy development and the range of potential solutions available was initially offered to the project team. In this respect, the role of the librarian dominated. The information retrieval expertise and considerations of archivists and records managers did not feature at that time. "*This blindness was in part reinforced by the published literature. To date, the contribution of archivists and records managers in developing taxonomies and associated information retrieval solutions appears to be understated in comparison with the perceived role of the librarian.*" (Milne, 2007a, p.8).

While reflecting upon information retrieval techniques allied to librarianship played an important part in reaching an understanding of, and contextualising the process of taxonomy development - information retrieval practices advanced by the records management discipline emerged as the predominate influence; driving the information architecture solutions developed to support the University Portal.

This paper seeks to illustrate how one area of information retrieval allied to records management traditions i.e. functional classification was applied to generate improvements concerning the organisation and retrieval of information within an on-line environment. Initially, functional classification was mooted as a means of creating a logical, repeatable and stable platform for organising materials within the University portal, where other approaches notably subject and administrative based arrangements were found to be lacking, in a peer-reviewed opinion piece (Milne, 2007a). The hypothesis offered (Milne, 2007a) was tested during the University's portal implementation. Case study materials have since been produced to support the (successful) submission by the University for the *JISC award for records & information management* (Milne, 2007b). These materials illustrate where functional classification directed the development of the key elements required of an information architecture i.e. organisational structure, navigation, labelling, search systems and metadata/controlled vocabulary in the workplace. Building on the initial hypothesis and the action learning undertaken, it is hoped that the experiences gained at Abertay and a wider assessment of the approaches taken can now prompt further exploration and discussion of the role of records management approaches to information retrieval, as an additional influence in the development of information architectures.

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[1] Hereafter referred to as UAD, Abertay or the University

2. The problem: improving a failing intranet

The following defence of systematic classification offered by Shepherd and Yeo (2003, p.74-5) accurately and concisely summarised the root cause of a key deficiency in the University's intranet (as then was) i.e. the absence of a framework to support the logical and repeatable organisation of content:

> "*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.*"

A devolved publishing model (i.e. local 'web' coordinators within academic schools and support services with responsibility for page creation and maintenance) fuelled the problem: introducing a significant degree of inconsistency throughout the intranet as it expanded. Difficulties in effectively locating and retrieving content were exacerbated through the lack of a sophisticated keyword search function i.e. specifically no metadata facility was available to help improve precision. Users were dependent upon a full-text search facility, which came with the burden of a high degree of recall.

These failings introduced a number of barriers, which frequently hampered the ability of students and staff to effectively engage with the University – particularly where the intranet was intended to be the prime vehicle (indeed often a first point of contact) for sourcing information and advice. A key element of the business case driving the implementation of the University portal was the enhancement of the on-line experience for students. Thus, developing an effective *taxonomy* became a key business requirement.

2.1 Demystifying taxonomy: classification revisited

One of the initial challenges facing the UAD portal project team was to develop an understanding of *taxonomy* development as framed by our technological partners *Oracle consulting*. In this regard, the technical paper *Use oracle9iAS portal as your knowledge exchange* (Oracle Corp, c.2004) identified the various areas to be addressed, albeit often in an abstract manner. The process of discovery, leading to the advancement of the hypothesis that classification of information, resources and services within intranet and/or portal environments could be enhanced by applying the order of division: *function*, *activity*, task (transaction), sub-task was originally described and presented in Milne (2007a. p.7-16). To avoid revisiting in full the processes undertaken to develop the hypothesis that classification has a central role in taxonomy development, the core background themes useful for developing this discussion are presented here:

- "*Following dissection of the paper, it became apparent that the skills sets and competencies of information professionals would be integral to taxonomy development.*" (Milne, 2007a. p.9);

- "E*ssentially taxonomy development* [for the *Oracle 9iAS* portal platform] *was depicted as operating at two levels a primary taxonomy and a virtual taxonomy. Parallels emerged between taxonomy development and core information retrieval techniques… i.e. pre and post-coordinate indexing respectively.*" (Milne, 2007a. p.9);

- A literature review undertaken, which examined core texts on classification and information retrieval theories at the time found that "*the emergence of Intranet and corporate intranets appears to have reinvigorated discussions and writings concerning the role of classification* [to manage and improve access in the on-line arena]; (Milne, 2007a p.9-10);

- [Conversely] …"*when classification is discussed in standard records management texts… the potential to transfer* [information retrieval] *techniques used to develop business classification schemes to portal, intranets… does not appear to be acknowledged.*" (Milne, 2007a p.14-15).

2.2 How to applying classification techniques to support taxonomy development?

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. (Oracle Corp, c.2004) 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, 2007a) At this stage, the project team decided to focus on the development of the *primary taxonomy*. The work of developing solutions to support search (or a *virtual taxonomy* using Oracle's terminology) was addressed at a later stage, and is described here.

2.3 The subject and/or administrative approach?

Moving from the rhetoric of taxonomy (i.e. the project team having developed an understanding of 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, presented a significant challenge:

- The subject approach to information did not automatically lend itself to organising the rich array of content required to be represented in the portal. i.e. agreeing upon a citation order that could be consistently applied and repeated proved difficult. In addition it was anticipated that the addition of new subject areas over time would present difficulties, particularly should this require a significant change in the underlying structure;

- Neither was the grouping of content based on the originating administrative function deemed appropriate, given the transient nature of internal organisational structures.

Subsequently, an alternative approach was sought from which a primary taxonomy could be developed and sustained.

2.4 Classifying records and documenting their content

Materials exploring the classification of records were consulted heavily as part of the process of reading for a Masters degree in Records Management: notably the works of the National Archives (2002), National Archives of Australia (2003), Morelli (2003) and Shepherd & Yeo (2003). These were insightful, as they introduced an alternative approach to information management i.e. the functional approach, to which the author (at the time relying upon his training as a librarian) was not familiar.

Classification is an integral element of records management. Perhaps uniquely, the contribution of classification to this profession is recognised and partly defined by international standard ISO 15489-1:2001 (British Standards Institute, 2001). Functional classification offers a different perspective on information retrieval: as this approach deliberately distances itself from the traditional (subject) approach to classification, while also negating the use of organisational structures. Thus, an alternative, potentially viable method of organising information emerged prompting further investigation.

> "*Classification by function is based on the context of a record's creation and use, rather than on the content of the record itself. This means the record will be classified according to why it exists – i.e., its function – rather than what it is about – i.e., its subject. Linking records to their business context is a key requirement for making and capturing full and accurate records.*" (National Archives of Australia, 2003, p.7)

Section	Selected extracts
9.5.1 Classification of business activities	*"a) providing linkages between individual records which accumulate to provide a continuous record of activity,"* *"b) ensuring records are named in a consistent manner over time,"* *"c) assisting in the **retrieval** of all records relating to a particular **function or activity**,"*
9.5.2 Classification systems	*"Classification systems reflect the business of the organization from which they derive and are normally based on an analysis of the organization's **business activities**"*
9.5.3 Vocabulary controls	*"Classification systems and indexes may be supported by vocabulary controls that are suited to the complexity of the records of an organization."*
9.5.4 Indexing	*"Indexing can be done manually or be automatically generated. It may occur at various levels of aggregation within a records system."*

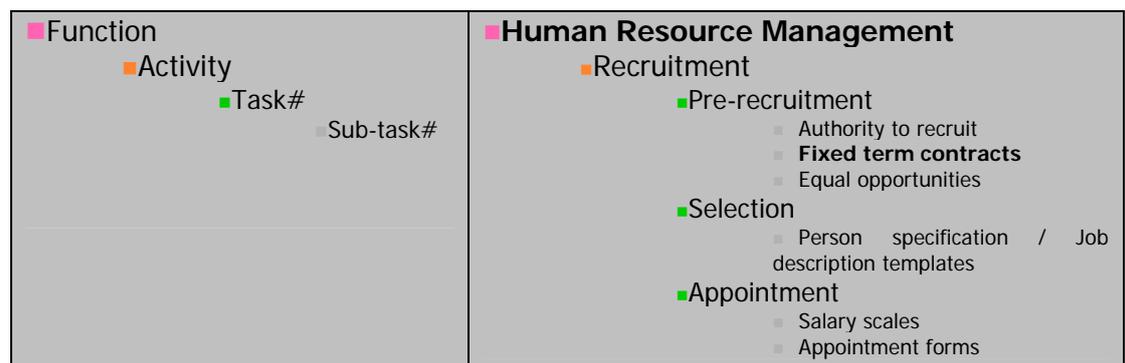**Figure 1 Information retrieval and records management ISO-15489-1:2001**

2.5 Demonstrating the potential application and benefits of contextual classification

The presentation of the hypothesis advocating the utilisation of functional classification techniques to create a method of organisation to structure information within on-line environments (Milne, 2007a) offered a detailed discussion illustrating (at the time the perceived) benefits of applying contextual classification, when developing taxonomies. Two scenarios offered earlier (fixed term contracts and

student assessment respectively) (Milne, 2007a p.11-12) are re-visited here for purposes of illustration. A third scenario presented as part of the University's submission to JISC for the *award in innovation & records management* (Milne, 2007b) is also provided to explore the stability and flexibility of contextual classification, over the traditional subject approach.

- Many recruiting managers were previously not aware of changes to employment law concerning the use of fixed-term contracts; [2]

- 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

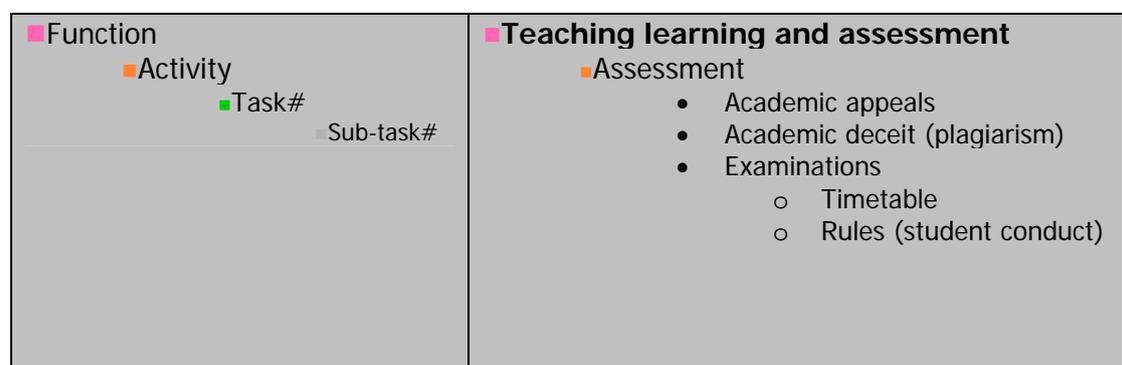- Function
  - Activity
    - Task#
      - Sub-task#

- **Human Resource Management**
  - Recruitment
    - Pre-recruitment
      - Authority to recruit
      - **Fixed term contracts**
      - Equal opportunities
    - Selection
      - Person specification / Job description templates
    - Appointment
      - Salary scales
      - Appointment forms

Figure 2 Exploring the application of contextual classification

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

- The scattering of related information resources and services across the intranet presents a series of difficulties. In many instances a holistic view of processes is not available;

- Consider assessment and examinations: a student may be required to visit a number of different sections of the University intranet to collate information on examination timetables (Registry), regulations for the use of calculators in examinations (University Secretariat), past papers (School intranet) and guidance on exam techniques (Student services);

- The ability to collocate materials previously scattered to create a holistic view of processes and/or tasks based on the context of an activity presents an option for providing a logical and helpful method of arrangement.

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

■Function
   ■Activity
      ■Task#
         ■Sub-task#

■**Teaching learning and assessment**
   ■Assessment
- Academic appeals
- Academic deceit (plagiarism)
- Examinations
  - Timetable
  - Rules (student conduct)

Figure 3 Exploring the application of contextual classification

- The core **business functions** undertaken by any organisation are relatively stable. For example the core work of universities is unlikely to deviate substantially from teaching, learning and research;

- The **function** of managing and developing people is likely to remain a constant feature as part of a university's work 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 4 Exploring the stability and flexibility of contextual classification

2.6 The hypothesis

Exploring and reflecting upon the functional approaches to information management developed and applied by records managers to create business classification and records classification schemes, indicated (after a relatively short period of time) that it was likely that a systematic classification (i.e. a citation order, characteristics of successive division) based on the following elements, would provide an appropriate method of organisation for creating a primary taxonomy (Milne, 2007a)

Business Classification Scheme	Records Classification Scheme
• Function	• Function
o Activity	o Activity
▪ Transaction	▪ Topic
	• Sub-topic

Classifying by *Function, Activity, Topic and sub-topic* could provide a:

- **Stable** (i.e. future proof structure by virtue of the relative stability of business functions and activities);

- **Repeatable** method of organising materials, creating a suitable navigable structure by virtue of the citation order utilised;

- **Holistic** view of events [i.e. tasks, topics, transactions] by virtue of the contextual grouping produced as a result of the classification i.e. drawing upon "*how records* [content published to a portal/intranet] *are classified and organized to ensure that contextual information is available and users' needs are met.*" (Shepherd and Yeo, 2003, p.72)

As part of the process of implementing the University portal, a pilot study was identified through which the hypothesis was tested.

3 Case study - Taxonomy pilot: the "quality guide"

One of the first areas to be developed within the portal, was the University's depository for materials associated with quality enhancement and assurance processes. The provision of this information on the intranet (commonly referred to as the "*Quality Guide*") was found to be lacking. Here, materials were organised and presented alphabetically. This arrangement relied upon a familiarity with document names and University terminology. This resource also suffered from mission creep. Content with at best a loose connection to quality assurance processes e.g. a links to the Library catalogue and the Chaplaincy found their way into the Quality Guide. The absence of effective search facility also caused frustration.

Figure 5 The Quality Guide

4 Applying contextual classification to develop an information architecture

An overview of the work undertaken to Abertay to apply functional classification techniques to develop systems for organising and retrieving information is presented over six steps.

4.1 Step 1: review of technical literature – functional classification

Technical writings on functional classification, notably step B of the DIRKS methodology i.e. *analysis of business activity* (National Archives of Australia, 2002) were reviewed. These provided a valuable guidance, in particular clarifying the boundaries between *functions, activities* and *transactions*.

Source	Notes
National Archives of Australia (2003). *Overview of classification tools for records management.*	• Advanced understanding of functional classification • Section 3 "*Explaining classification levels*" guided the development of the citation order function, activity, task, sub-task ○ Note, the terms "*topic*" and "*sub-topic*" as presented in the text were replaced by "*task*" and "*sub-task*" respectively, as colleagues resonated with these terms more readily • Reinforced the value of undertaking Step B of the DIRKS methodology (specifically section B.4.2), to identify and develop functions and activities i.e. "*defining the boundaries*"
National Archives of Australia (2002). *Managing business information: DIRKS.*	• Step B of the methodology "*Analysis of business activity*" was reviewed, with section B.4 undertaken to identify activities and related topics (or "*transactions*") if applying DIRKS terminology

Figure 6 Technical reference sources clarifying functional classification

4.2 Step 2: defining the functional area "quality enhancement and assurance"

In taking a top-down approach to taxonomy development it was necessary to define the function of quality assurance/enhancement. The Quality Guide had 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 7 defining the quality enhancement/assurance function

4.3 Step 3: identifying activities

"*Activities are the major tasks performed by the organisation to accomplish each of its functions. Several activities may be associated with each function.*" (National Archives of Australia, 2002 p.8) A sector specific (higher education) business classification scheme was consulted to identify activities allied to quality functions. This eliminated the requirement to conduct a detailed information audit and review of business processes. The quality activities identified provided a solid foundation. Following a period of analysis and discussion, the following activities were agreed:

- 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

Arguably this categorisation represented the key business functions, which any university would be expected to undertake. As quality enhancement/assurance should permeate through all business functions, the activity list identified gave confidence that there was robustness and accuracy in the preceding analysis.

4.4 Step 4: identifying tasks, developing a taxonomy schedule

"*Transactions are the smallest unit of business activity. They should be tasks, not subjects or record types. Transactions will help define the scope or boundaries of activities and provide the basis for identifying, in detail in Step C [organisational record keeping requirements], the records that are required to meet the business needs of the organisation.*" (National Archives of Australia, 2002 p.8)

Each activity was reviewed to identify its component topics and sub-topics. 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, and activity introduced at Step 1 and Step 2 to ensure clarity and consistency in the analysis. A draft taxonomy schedule was then produced, and refined.

| |
|---|
| ***Function: Quality Enhancement/Assurance*** |
| **Activity: Teaching, Learning and Assessment** |
| ❑ Topics (place here: Institutional strategies, policy and procedures for developing and enhancing teaching & learning and employability
 o Sub-topics |
| ❑ Assessment: Academic regulations and associated procedures
 o Mitigating circumstances
 o Examination rules & regulations
 o Academic appeals
 o Academic deceit
 o Code of assessment principles
 o Assessment archiving
❑ Timetables / Academic calendar
❑ Enhancing teaching & learning
 o Teaching fabric |

Figure 8 Extract from the taxonomy schedule

4.5 Step 5: building the physical taxonomy

The taxonomy (hierarchical structure) was then built within the Oracle portal platform, using the tools provided whereby:

Functional classification device	Oracle portal device
Function	Page group
Activity	Category
Topic	Perspective

Thus, the taxonomy developed (on paper) was translated into a hierarchical structure within the portal by application of the appropriate device (Oracle page groups, Oracle pages and Oracle sub-page), which then established a hierarchy where:
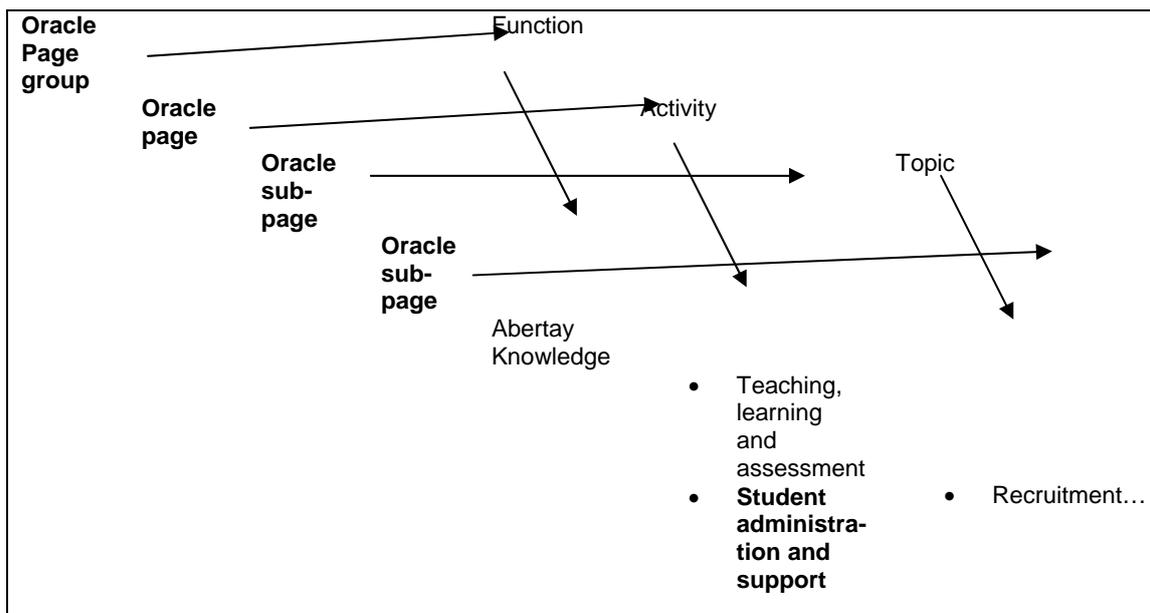
Figure 9 Developing the hierarchical structure within Oracle portal

        Figure 10 illustrates the top down hierarchy created by the application of a citation order: function, activity, and topic. Importantly, here, (functional) classification provides a holistic view of a activities and the topics associated with each. A contextual grouping of content is provided i.e. a student or member of staff can find that all of the materials allied to the topic of administration have been brought together. The alphabetic arrangement previously 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 *Topic* levels provided a valuable alternative and important means of engaging and exploring materials on-line. The benefits of collocating materials together through contextual arrangement are explored in more depth in the presentation of the original hypothesis (Milne, 2007a, p.12-13.)

Abertay Knowledge

This area of the portal 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. Browse to the information you are looking for under the ten broad topic headings or use the search engine to find documents. If you have any comments about the site please e-mail: abertayknowledge@abertay.ac.uk.

Search Abertay Knowledge [ ] Search

University governance
Information on academic management (Senate), executive management (SMG), financial compliance, governance (Court), health and safety, and the legal and quality frameworks of the University.

Planning, reporting and risk management
Information on the University mission and strategy, together with the planning, reporting and risk management processes in place and the outputs of these processes.

Programme and subject development and review
Information on the annual and periodic approval and review of: modules, programmes, collaborations, external examiners, professional accreditations.

Teaching learning and assessment
Information on the academic regulations, assessment, calendars and timetabling, enhancement and teaching space issues, and key University strategies which influence teaching, learning and assessment developments at Abertay.

Student Administration and Support
Information on admission, bursaries/grant aid, complaints, discipline, financial support, induction, graduation, recruitment, registration/fees, records, special needs, welfare advice, and withdrawal from study.

Research
Information on research ethics, funding, the RAE, the periodic re research degrees provision, research strategy, research student regulations and procedures, and supervision.

Commercialisation and knowledge transfer
Information on the commerical activities of the University, inlcudi commercial activites register and intellectual property policy.

Human resource management
Information and policies relating to Human resource managemen UAD. Currently this section includes a link to the Human Resou portal pages as well as information on strategy and training.

Information governance and security
Strategies, policies and procedures concerning the effective use safeguarding of the University information, records and data

Estates and campus development
Policies, strategies and procedures relating to the physical infra of the University.

Function: quality enhancement/assurance i.e. Abertay Knowledge

Student Administration and Support

Sub Sections

Admission
Includes the University Admissions Policy and Procedures for the admission of students

Complaints
Includes the Student Complaints Procedure

Discipline
Includes the Student Disciplinary Code of Practice

Financial support

Graduation
Includes the Procedures for Conferment of Awards and the Issuing of Certificates and Transcripts

Recruitment
Includes Procedures for the Recruitment of Students

Registration and fees
Includes Procedures for the Enrolment and Registration of Students

Student records
Student records and maintained by the University Registry and are the responsibilty of the Registrar. The Registry portal pages can be accessed from the portal frontpage

Users with Disabilities
Includes a Guide for Students with Disabilities

Welfare
Includes the Student Charter and Mental Well Being Policy for Students

Withdrawal
Procedures for the Withdrawal of Students

Activity: Student Administration and Support

Recruitment

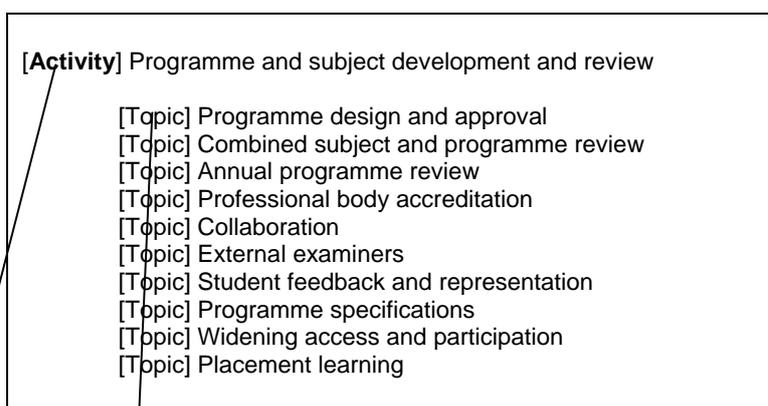ncludes Procedures for the Recruitment of Students

Documents

Procedures for the recruitment of students

Topic: Recruitment (student)

Figure 10 Extract: Abertay Knowledge: taxonomy

4.6 Step 6: development of metadata, an elementary thesaurofacet

As noted earlier, the initial requirements for taxonomy creation, to support the Abertay portal implementation focused on creating a *primary taxonomy* i.e. the creation of a hierarchical structure to support organisation of content. One of the by-products of the (functional) classification structure was the creation of a controlled vocabulary. Here, metadata for search was partly derived from the classification structure, where the language produced for [**Activity**] and [**Topic**] elements were used to index materials to support retrieval.

[**Activity**] Programme and subject development and review

    [Topic] Programme design and approval
    [Topic] Combined subject and programme review
    [Topic] Annual programme review
    [Topic] Professional body accreditation
    [Topic] Collaboration
    [Topic] External examiners
    [Topic] Student feedback and representation
    [Topic] Programme specifications
    [Topic] Widening access and participation
    [Topic] Placement learning

Figure 11 Search metadata derived from the (functional) classification

Properties	
Created	30-JUL-2008 03:30 PM
Last Modified	09-SEP-2008 02:30 PM
Item Link	https://portal.abertay.ac.uk/portal/page/portal/533F540998D2EC5CE0403CC14 1A06FC6
File Name	Programme-approval-handbook-v-3-0.pdf
Display Name	Programme approval handbook: new programme design, approval and annual review
Author	Secretariat, Deputy University Secretary
Publish Date	09-SEP-2008 12:00 AM
Review Date	30-JUN-2009 12:00 AM
Approval Date	04-SEP-2008 12:00 AM
Approved By	Quality Assurance Committee
Version Number	3
Expiration Period	Never Expires
Category	Programme and subject development and review
Perspectives	Programme design and approval
Description	<None>
Basic Search Keywords	<None>
Document Type	Handbook/manual
Display Option	Link That Displays Item In Full Browser Window

Figure 12 Search metadata

4.7 Thesaurofacet

The technique employed to generate metadata was partially linked to the *thesaurofacet* - where each term in the classification scheme appears in a thesaurus. Aitchson*, et al*, (1969) originally presented the notion of the thesaurofacet, where it was found that the context and the relationships created in developing a faceted classification scheme in essence produced as a by-product a thesaurus and a controlled vocabulary. No attempt was made to develop a full thesaurus for "*Abertay Knowledge.*" The indexing terms used to build the **Category** [Activity] and **Perspective** [Topic] lists are strictly controlled. (Note, is possible for a term to represent an Activity and a Topic).

Category	Corporate information management
Category	Court
Category	Data handling
Category	Data protection
Category	Developing collections, resources and services
Category	Discipline
Category	Emergency planning
Category	Employee health surveillance
Category	Employee relations
Category	Enhancement
Category	Equality and diversity
Category	Estate and campus development
Category	Ethics
Category	External examiners

Perspective		External examiners
Perspective		External training
Perspective		Family commitments
Perspective		FAQs
Perspective		Fees
Perspective		File management
Perspective		Finance Authorised Signatories
Perspective		Financial compliance
Perspective		Financial support

Figure 13 Controlled vocabulary: Category [Activity] and Perspective [Topic]

5. Functional classification: what role in developing information architectures?

As evidenced in the case study presented here and through the University's successful submission to the JISC award for innovation in records & information management (Milne, 2007b) functional classification techniques played a pivotal role in developing an implementing information management solutions, necessary to drive the portal implementation at Abertay. However, it is important to recognise that the initial deployment of functional classification techniques as described in the case study were implemented to support a pre-coordinate information retrieval system. Again, the first challenge set to the project team in developing a *primary taxonomy* was that of creating a navigable structure. The project team response was to develop a top-down hierarchical structure. The functional classification techniques deployed to establish a citation order of *function, activity, topic, sub-topic* were developed by records managers to produce hierarchical classification structures to manage (paper) records. Latterly, post coordinate (search) systems, influenced by elements of functional classification were developed to support the portal implementation following the completion of the taxonomy.

It is important to assess the validity of applying pre-coordinated indexing techniques to create information retrieval solutions within on-line environments given the high degree of criticism made by academics and information architects towards the deployment of hierarchical classification solutions in Web/intranets. Peter Morville and Louis Rosenfield, both prominent writers on information architecture advocate the use of faceted classification over hierarchical approaches in their seminal work *information architecture: for the world wide web*.

"*Based on our field experience and their research results,* [3] *we expect to see mounting interest in these solutions* [facet analysis/faceted classification.] *We predict the metadata, controlled vocabularies, and thesauri will become the building blocks of most major web sites and intranets. Single-taxonomy solutions* [i.e. top-down hierarchy] *will give way to more flexible, faceted approaches. Put simply, we see facets in your future.*" (Morville and Rosenfeld, 2002, p.208)

A view which they continue to maintain in the third edition of their work:

"*Metadata, controlled vocabularies, and thesauri are increasingly becoming the building blocks of most major web sites and intranets. Single-taxonomy solutions are giving way to more flexible, faceted approaches. Put simply, if you're an information architect. We see facets in your future!*" (Morville and Rosenfeld, 2007, p.227)

5.1 Faceted classification: a building block for developing information architectures

Morville and Rosenfeld (2007) are not lone voices in advocating the use of facated classification to support the creation and development of information retrieval systems to support information architectures. A wider literature review reveals support for faceted classification as a mechanism to leverage improvements in information retrieval from Web/intranet environments. (Broughton, 2006), (Fox, 2005)

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[3] Work at Berkley's School of Information Management and Systems into the value and role of faceted classification in the development of metadata and controlled vocabularies in search and navigation is offered as an example

and (Franklin, 2003). It is notable that, despite the relative infancy in terms of the debate of the role of classification allied to information architecture development, that where the merits of the faceted classification were endorsed, the utilisation of hierarchical classification in similar circumstances was resolutely discounted.

> "…*the case that faceted classification has itself become an important method of information organisation and display on the Web. This seems to be a fairly recent development.*" (Broughton, 2006, p.61)

> "*The logical and predictable structure of the faceted system undoubtedly makes it compatible with the requirements of mechanisation in a way that enumerative and pre-coordinated systems are not. Even where linear order is not a major consideration and the aspects of the classification related to combination and display of components are very much secondary, the simplicity and logic of the faceted approach is appealing.*" (Broughton, 2006, p.61)

> Compared with faceted approaches hierarchical/enumerative classification struggles to provide for flexibility. "*A classification scheme* [hierarchical/enumerative] *which is not flexible and forward looking is doomed to extension because the fields of knowledge will continue to diversify and bifurcate.*" (Fox, 2005, p.23)

> Support for faceted classification amongst information architects is strong. A review of library of the *Information Architecture Institute* provides an insight into the practitioner viewpoint.

> "*The Library is intended to provide access to an international collection of the best articles, books, blogs, guides, reports, and other resources related to the field of information architecture.*" (Institute of Information Architects, c2004)

Works on faceted classification feature prominently within the Institute's library, there being 20 articles and papers presented under this specific subject heading, with 40 items listed under the generic heading of classification. Practitioner interest in faceted classification was also gauged by reviewing postings submitted to a dedicated information architecture mailing list. An examination (keyword poll) of the postings to the *SIGIA-L* archives (an information architecture forum sponsored by the American Society for Information Science) demonstrates that practitioners are engaging with facets and faceted classification. There is evidence to support the premise that "*we see facets in your future.*" (Morville and Rosenfeld, 2007, p.227)

Keyword (restricted to main subject + body of posting) and frequency	Last posting	First posting	Notes
Morville 466 hits	03/04/2009	18/04/2000	Morville as a recognised authority in information architecture was selected as a benchmark keyword
Facet 196 hits	30/01/2009	15/05/2000	"faceted", "facet" and "faceted classification" were used to poll the extent to which practicing information architects were engaging with this approach to information retrieval. It was important to gauge whether the advocacy for faceted classification exhibited by Morville and Rosenfeld (2002) and others was shared by practising information architects.
Faceted 506 hits	30/01/2009	20/04/2000	
"faceted" + classification 290 hits	30/01/2009	19/09/2000	

Figure 14 Assessing practitioner engagement with faceted classification: review of keyword use within SIGIA-L

5.2 Function, activity, topic, sub-topic as facets?

The limitations and criticisms expressed in applying top down/hierarchal classification and inversely the support offered for the faceted approach in developing information retrieval systems for Web/intranet environments suggests that the application of functional classification techniques to develop taxonomies is likely to be limited. Given the value in describing content in terms of business function, activity, topic as an alternative (or in addition) to the subject approach, prompted an assessment of the value of creating facets for to represent *function, activity, topic, sub-topic*.

Morville and Rosenfeld (2007, p.221-222) review the facets established by S. R. Ranganathan. While accepting the principles of faceted classification, they "*…don't tend to use Ranganathan's facets. Instead, common facets in the business world include:*

- *Topic*
- *Product*
- *Document type*
- *Audience*
- *Geography*
- *Price."*

It is reasonable to make the assumption, that these alternative (business focused) facets emerged through experiences gained in the development of e-commerce Web/intranet sites, given the examples cited by Morville and Rosenfeld (2007, pp.222-226) illustrating the application of faceted classification on-line. And, as a consequence this set of facets offered is likely to be limited in scope.

The focus on the '*business*' world as a criterion to develop facets resonated with the development of functional classification schemes. In both instances, classification philosophies are based on business constructs. While it is accepted

that the scope for applying functional classification techniques in a pre-coordinated manner to construct hierarchical structures within Web/intranet environments is limited (given the criticisms raised in the literature and the practitioner support for faceted over hierarchical classification), there are advantages to utilising functional classification techniques in a post-coordinated matter i.e. working with facets representative of *function, activity, topic, sub-topic* in addition to other facets.

5.3 Function, activity, topic as facets

In the development of Abertay Knowledge, the functional classification devices *Activity* and *Topic* were also utilised as facets. This was introduced in Step 6, of the case study. To recap: *metadata for search was partly derived from the classification structure, where the language produced for [**Activity**] and [**Topic**] elements was used to index materials to support retrieval.*

Properties	
Created	30-JUN-2008 05:11 PM
Last Modified	30-JUN-2008 05:11 PM
Item Link	https://portal.abertay.ac.uk/portal/page/portal/50E552EB018B64B0E0403CC141A00311
File Name	Admissions-Policy-Approved-V2-0.pdf
Display Name	Admissions policy
Author	Registrar
Publish Date	30-JUN-2008 05:10 PM
Review Date	30-JUN-2013 12:00 AM
Approval Date	16-MAY-2007 12:00 AM
Approved By	Senate
Version Number	2
Expiration Period	Never Expires
Category	Student administration and support
Perspectives	Admissions
Description	<None>
Basic Search Keywords	<None>
Document Type	Policy

Figure 15 Activity and topic as facets

Figure 15 illustrates the full metadata-set attached to objects (in this instance documents) published to the portal.

5.4 Creating additional views via search (post co-ordination)

Students and staff are not restricted to browsing the navigable structure to achieve a holistic view of activities and/or topics. As the metadata contains elements to index *Function*[4], *Activity* and *Topic*, users have the ability to create their own views of materials where they do not wish to engage with the navigable structure provided.

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[4] The function metadata elements are available to users from the portal's advanced search facility.

Currently, these additional access points are facilitated through an advanced search and a custom search facility. In the advance search, users select and combine facets as per their requirements. The custom search facility executes a predefined search, for example displaying all the policies and procedures allied to human resources. This is useful, as the taxonomy scatters document types. The contextual arrangement (established by the citation order *function, activity, topic*) would pull together all document types allied to the parent activity. Thus, a user could see all policies and procedures allied to the activity of *Staff Development*. Users can also manipulate facets, based to the results from a search. Clicking on the required facet (*function, activity*, topic, subject-keyword will return all the objects indexed under that term. (See Figure 17 where items allied to *information governance and security* have been returned).

HR Policies and Procedures

Policies & Procedures

Alcohol and Substance Misuse Policy 9%
Create Date: 30-SEP-2008 Page Group: **Human Resources Well-being Alcohol and substance misuse**

Career break policy 9%
Create Date: 28-NOV-2008 Page Group: **Human Resources Working at Abertay Flexible working**

Disability Equality Policy [Staff and Students] 010708 9%
Create Date: 11-NOV-2008 Page Group: **Human Resources Equality and diversity Disability**

Discipline Procedure 9%
Create Date: 24-SEP-2008 Page Group: **Human Resources Working at Abertay Discipline**

Equal Opportunities Policy 010708 9%
Create Date: 11-NOV-2008 Page Group: **Human Resources Equality and diversity Gender Race Religious beliefs Sexual orientation**

Equal Pay Statement 9%
Create Date: 23-SEP-2008 Page Group: **Human Resources Pay and benefits Gender Pay**

Fixed Term Contracts Policy 9%
Create Date: 23-OCT-2008 Page Group: **Human Resources Working at Abertay Fixed-term contracts**

Flexible working scheme 9%
Create Date: 28-NOV-2008 Page Group: **Human Resources Working at Abertay Flexible working**

Grievance Procedure 9%
Create Date: 24-SEP-2008 Page Group: **Human Resources Working at Abertay Grievance**

Figure 16 Custom search
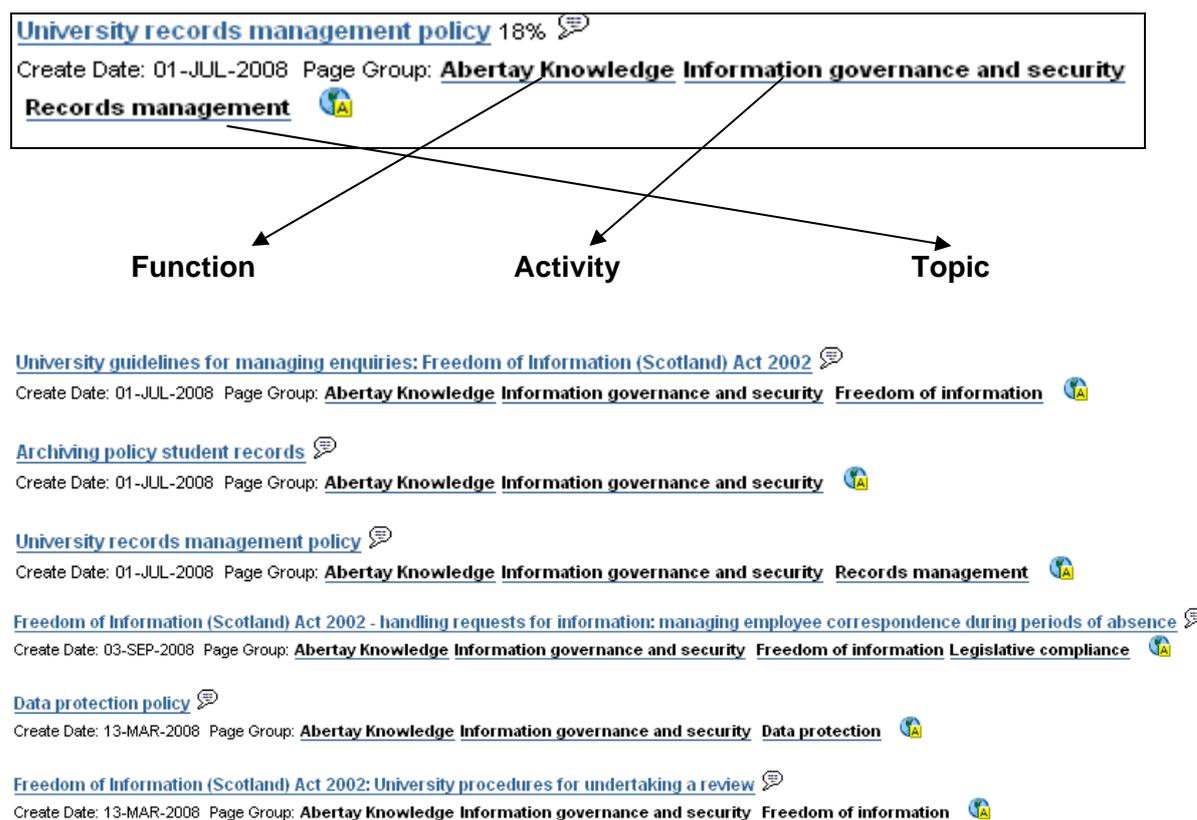
Figure 17 Function, Activity and Topic as facets

6. Conclusions

The contribution of the librarianship community in the development of information retrieval solutions (organising, labelling, navigation, search systems and thesauri, controlled vocabularies and metadata) to support information architectures is widely acknowledged. However, the potential contributions which the records management profession can bring to the development of information architectures are rarely considered. This is illustrated in a set of posting made on the Information Architecture Mailing list SIGIA-L: on 28 April 2005, an enquiry was made to the Information Architecture community as to whether anyone had experience of a functional based controlled vocabulary. The post received one reply, where the respondent offered to share experiences of producing a *business classification scheme*. This was followed up on the 30 April, where a poster noted their surprise that Morville and Rosenfeld (2002) did not explore the role of records management in their (seminal) work, particularly as they felt there was "*strong similarities*" between these professions. The final post on the 30 April, was made by Peter Morville, requesting more details on the work of records managers and their potential role in information architecture.

Experience gained in the workplace at Abertay found that the application of functional classification techniques played a valuable role in developing information retrieval solutions to a problem, where the subject approach had failed to yield an acceptable solution. While it is accepted that applying functional classification techniques to developing hierarchical structures may have limited application in on-line environments, compared with the development of faceted classification influenced solutions, there is evidence from the Abertay experience that applying

functional classification in a faceted manner also works. The use of functional classification at Abertay has extended from the initial pilot. The functional classification techniques described here have been used to develop the Library, Human Resources, Finance, Estates & Campus infrastructure functions within the portal. Here, functional classification provides a stable, repeatable model from which to manage information, to support a hierarchical (taxonomy) organisation (at Oracle page level) and faceted search functionality.

When presenting the initial hypothesis advocating the use of functional classification to develop a taxonomy, one of the conclusions offered was that it was unfortunate that the role of the records management profession in developing information retrieval solutions was not more widely recognised. And that as a consequence opportunities to work in partnership to re-invigorate writings on the application of classification techniques to aid the development of information architectures and the wider development of information retrieval as a subject discipline should be assessed. (Milne. 2007a, p.15) Part of the motivation, for the University applying for the JISC *award for innovation in records & information management* was to further raise awareness of the potential to apply records management classification techniques in the field of information architecture. It is hoped that this paper provides further scope for reflection, and that a wider debate may emerge.

References

Aitchison, J*., et al.* (1969) *Thesaurofacet: a thesaurus and faceted classification for engineering and related subjects.* Whetstone, Leicester: English Electric Company Ltd.

British Standards Institute. (2001) *BS ISO 15489-1:2001 Information and documentation records management: Part 1 General.* London: BSi.

Broughton, V. (2006) The need for a faceted classification as the basis of all methods of information retrieval. *ASLIB Proceedings.* 58(1): pp.49-72.
Fox, R. (2005) Cataloging our information architecture. *OCLC Systems and Services.* 21(1): pp.23-29.

Milne, C. (2007a) Taxonomy development: assessing the merits of contextual classification. *Records Management Journal.* 17(1): pp.7-16.

Milne, C. (2007b) 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.* [online]. Available from: Joint Information Systems Committee on the World Wide Web: http://www.jiscinfonet.ac.uk/case-studies/innovation2008/abertay-dundee.pdf [Accessed 15th May 2009].

Morelli, J. (2005) Business classification schemes: issues and options. *Records Management Society Bulletin.* 124(Feb 2005).

Morville, P and Rosenfeld. (2002) *Information architecture for the world wide web.* 2nd ed. Farnham: O'Reilly.

Morville, P and Rosenfeld. (2007) *Information architecture for the world wide web.* 3rd ed. Cambridge: O'Reilly.

National Archives of Australia. (2002) Managing business information: DIRKS [online]. Available from: National Archives of Australia on the World Wide Web: http://www.naa.gov.au/recordkeeping/dirks/summary.html [Accessed 14th November 2006].

National Archives of Australia. (2003) *Overview of classification tools for records management*. Canberra: National Archives of Australia. Available from: National Archives of Australia on the World Wide Web: http://www.naa.gov.au/Images/classifcation%20tools_tcm2-1030.pdf [Accessed 15 May 2009].

Oracle. (c2004) *Use Oracle9ias portal as your knowledge exchange*: *Paper # 30751*.

Shepherd, E. and Yeo, G. (2003) *Managing records*: *a handbook of principles and practice*. London: Facet.