**Taxonomy development: assessing the merits of contextual classification**

**Abstract: Purpose**
To share personal experience on the early stages of taxonomy construction, reflecting on the potential role of contextual classification techniques as applied by the records management profession as a tool in effectively organising information, resources and services within intranet and/or portal environments. The paper also assesses the additional benefits to be secured where linking content to business purposes can create or reveal new meaning.

**Design/methodology/approach**
Draws on experience, personal opinion, published literature and discussions with peers to assess the applicability of contextual classification as a tool to support taxonomy development.

**Findings**
Concludes that classification of information, resources and services within intranet and/or portal environments using a citation order of function, activity, task, sub-task is likely to be of significant value, requiring further investigation to fully assess impact and applicability. Contextual classification receives much discussion in general records management terms, however its applicability in supporting portal and/or intranet development appears to receive little attention. The requirement to generate improvements in information retrieval from a host of on-line services (of which taxonomy development is one example) is reinvigorating the role of the informational professional. Given the criticality of improving the management and retrieval of information it is desirable that stronger interdisciplinary links are established across the information profession to further develop ‘information retrieval’ as a subject discipline.

**Originality/value**
The article suggests that the role of contextual classification to organise information, resources and services within intranets/portals requires further investigation and reflection to assess its applicability, value and impact. Initial findings and reflection of the application of contextual classification in the design of elements of a university portal taxonomy have proven to be successful, suggesting that wider discussion and reflection is now required. It is also suggested that the information profession take steps to build stronger interdisciplinary links to advance the development of information retrieval as a subject discipline.

**Article type**
Viewpoint
Introduction

Taxonomy development: a logical role for information professionals?

Gilchrist (2003) via literature review and case study seeks to appraise and clarify the application of the terms “thesauri, taxonomies and ontologies” as used by information scientists and those concerned with Web development. It is beyond the scope of this paper to re-visit this debate to attempt to shed more light on the nature of these aspects of information retrieval and knowledge management, other than to note that Gilchrist appears to provide clarity in this matter. Gilchrist’s conclusion (2003), p.14 opens with the point “if you wanted to know the meaning of a word, you should see how it is used.” This indeed is valuable advice. Reviewing guidance issued by (Oracle c2004) contextualised the process of taxonomy development with regard to portal implementation at the University of Abertay Dundee. The application of the term ‘taxonomy’ by Oracle resonates with (Gilchrist 2003) where “primary taxonomy” is concerned with creating hierarchical structures to support the organisation and retrieval of information, resources and services within a portal environment and “virtual taxonomies” support information retrieval via keyword searching (which may or may not involve use of controlled language.) It is against this backdrop that taxonomy development is discussed within this paper.

Many in the librarianship and information profession, including myself (Milne and MacCabe 2004), have enthusiastically extolled the virtues of applying information retrieval theories and techniques, designed and developed to manage library collections as transferable solutions to organising and managing content within the online environment specifically intranets and/or portals.

The belief that the librarianship profession has a core contribution to make in developing information solutions within online environments stems partly from the widespread use of the now fashionable term taxonomy, which for the moment, is loosely defined as ‘the science of classification.’ Classification and related techniques such as cataloguing and indexing are being acknowledged as core elements of the profession. The contribution of the librarian in developing taxonomies is acknowledged by a number of commentators. Indeed (Cote 2005) provides a concise overview of the various facets of taxonomy development, mapping (or if you wish classifying) acknowledged competencies and skills sets of the librarian against tasks relevant to taxonomy development. However, this is not to suggest that taxonomy development should be considered to be the sole preserve of the librarian. Admittedly it was not until undertaking an MSc in Records Management that I stopped to think and consider that improving access to information in all environments is fundamental to the role of all information professionals. As a librarian I was divorced from the information retrieval expertise and considerations of archivists and records managers. This blindness was in part reinforced by 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. Indeed, as this paper seeks to illustrate much can be achieved where archivists, librarians and records managers work collaboratively, pulling together their collective expertise and strengths to build more effective

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1 Information, resources and services
information retrieval solutions to help organisations and the communities they serve to face the emerging challenges of the knowledge economy.

**Experiential learning: developing a taxonomy at the University of Abertay Dundee**

Internally the argument was made (and accepted) that librarians at Abertay would take a lead role in developing the underlying taxonomy for the University’s portal. Indeed, such was the belief that librarians were equipped to apply information retrieval techniques to organising information within the online environment that job descriptions and person specifications for new academic librarian posts were revised, specifically noting the requirement to blend and apply ‘traditional’ information retrieval techniques to taxonomy development.

However, during the process of determining the underlying classification scheme (or more specifically a citation order) necessary to create a navigable structure for the taxonomy the solution that emerged emanated from classification philosophy allied to the records management profession and not only the librarianship arena as was envisaged.

**Opinion piece, Taxonomy development: assessing the merits of contextual classification**

This paper presents the author’s opinion, based on personal experience, reflection and a passing examination of the literature, advocating the relevancy of applying records management techniques allied to the construction of business classification schemes as pertinent solutions when developing taxonomies to effectively organise information within intranets and/or portals. It seeks to initiate debate starting from the premise that contextual classification i.e. classification by function, activity, task, sub-task should be considered as a model for the organisation of information, services and resources within intranets and/or portals and similar online environments. Furthermore, classification to establish context can act as a powerful business improvement agent where the relevancy and role of information emanating from the business context is established and presented.


**Taxonomy development: classification revisited**

The role of pre and post-coordinate indexing in taxonomy development

The University of Abertay Dundee is currently developing a portal, using Oracle technology. The portal is intended to replace the existing University intranet and Internet presence to create a substantially improved online presence. The requirement to develop a taxonomy as an integral element of portal development was impressed upon the portal project team during discussions with Oracle consultancy.

The paper “*Use oracle91as Portal as your knowledge exchange*” (Oracle c2004) contextualised the process of taxonomy development with regard to the University’s portal implementation. It framed the task that lay ahead. Initially some colleagues held the view that taxonomy development fell within the IT professionals’ domain and that external consultancy might be required to bridge the skills gap. However, following dissection of the paper, it became apparent that the skills sets and competencies of information professionals would be integral to taxonomy development. The argument was made and accepted that the skills sets of librarians and web developers should be pooled to develop the portal taxonomy.

Essentially taxonomy development was depicted as operating at two levels a primary taxonomy and a virtual taxonomy. Parallels emerged between taxonomy development and core information retrieval techniques developed by the librarianship profession i.e. pre and post-coordinate indexing respectively. These linkages are illustrated in Figure 1. The association between taxonomy development and pre and post-coordinate indexing techniques initiated discussion on the role of the librarian in supporting taxonomy development within the University.

*Figure 1 Primary & Virtual Taxonomy Mapped Against Pre and Post-coordinate Indexing*

<table>
<thead>
<tr>
<th>Primary Taxonomy (equivalent to)</th>
</tr>
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<tbody>
<tr>
<td>▪ Pre-coordinated indexing</td>
</tr>
<tr>
<td>o Predefined grouping of content and services, users have a predefined path to follow to find and retrieve information by virtue of what clicks they have to make and [hypertext] links to follow</td>
</tr>
<tr>
<td>o Essentially equates to hierarchical classification</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Virtual Taxonomy (equivalent to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Post-coordinated indexing</td>
</tr>
<tr>
<td>o User decides how to find and retrieve information via the selection of keywords and index terms, applied to a search engine</td>
</tr>
<tr>
<td>o Essentially cataloguing, indexing (application of search terms, use of controlled vocabulary) metadata development</td>
</tr>
</tbody>
</table>

2 Specifically Oracle Application Server 10g however, at the project outset an earlier version of this platform Oracle 9i/AS was deployed
The assertiveness of the librarianship profession in advocating solutions to taxonomy development

The emergence of the Internet and corporate intranets appears to have reinvigorated discussions and writings concerning the role of classification. A cursory examination of key texts on classification and information retrieval theory emanating from the librarianship arena such as Hunter (2002), Rowley & Farrow (2000) and Marcella & Maltby (2000), demonstrates resurgence in the role of this discipline. There is clear advocacy for the application of classification and related information retrieval techniques as integral elements underpinning taxonomy development. All of the texts noted above include chapters devoted to the application of classification techniques to manage and improve access to information in the online arena specifically Internet and intranet environments, a point to which I will return later.

The task and the problem

The first stage of the University’s taxonomy creation focused on the design and development of the primary taxonomy. The general approach to completing this task was understood i.e. the use of pre-coordinate classification techniques to produce a logical grouping of content, resources and services within the portal and the associated creation of a pre-determined hierarchical structure or pathways for users to follow. Despite there being a clear understanding of the nature of the task and a confidence that pre-coordinated indexing techniques would support a solution a significant barrier/unknown element 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, services and resources within the portal?

The subject approach to information

Librarians tend to classify materials by subject to create an effective and logical arrangement for information retrieval. The subject approach did not automatically lend itself to organising the rich range of information, resources and services, which require representation within the portal. Particularly as subjects are liable to change over time, with new subjects being introduced, an alternative approach and way of thinking was required.

Records Management approaches to classification

Classifying records and documenting their content

Classifying records and documenting their content

I am currently reading for an MSc in Records Management at Northumbria University and as a result I have been revisiting approaches to classification from a records management perspective. The following defence of systematic classification from Shepherd and Yeo (2003, p.74-75) accurately summarised existing difficulties with the University’s intranet provision.

“In many organisations…records systems [and intranets] are poorly structured. They may be based on administrative arrangements…. on subject
Reflection on the discussion of classification for records management Shepherd and Yeo (2003) and a foray into guidance issued from National Archives of Australia (2003) strongly indicated that a systematic classification based on:

- Function
- Activity
  - Task
  - Sub-task

would provide an appropriate citation order creating a logical and repeatable model for the organisation of material within the University’s portal at the primary taxonomy level.

A number of case studies were undertaken throughout the University. Application of the citation order: function, activity, task and sub-task as successive “characteristics of division” Hunter (2002) p.41 created a consistent model enabling systematic classification to be undertaken. Exemplar classification schemes were produced and discussions with colleagues ensued. Following consultation with colleagues throughout Schools and Services and a presentation to senior management the University accepted the case for using the functional approach as the basis for organising content within the portal at the primary taxonomy level. The contextual grouping of materials, which the citation order produced, was deemed to be particularly powerful and appropriate method of arrangement capable of enhancing student interaction with the University. Figure 2 provides an example.

**Benefits of the contextual arrangement**

Presently, the scattering of related information, resources and services can cause unnecessary and substantial difficulties for students and staff, particularly where the intranet is used as the main vehicle for engaging with the University where information, advice and guidance is sought out of ‘normal’ hours. In many instances a holistic overview of processes is not available. For example, 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 use of calculators in exams (secretariat), past papers (School intranet) etc. The ability to collocate information previously scattered to create a holistic view of processes and/or tasks based on context were viewed as a logical and helpful method of arrangement. In recent discussions the obscure topic of fixed-term contracts was used to highlight the advantages of creating a contextual arrangement of materials within the portal:

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3 Work to develop the virtual taxonomy has not yet commenced, hence the treatment / scope of the discussion concerning classification in this paper is limited to the primary taxonomy.
1. Recruiting managers may not be aware of changes to employment law concerning the use of fixed-term contracts;
2. A lack of awareness in this area is most likely explained by the artificial treatment/placement of information within an employment-legislation section of the University’s intranet;
3. Contextually information on fixed-term contracts exists to protect the University from entering into illegal conditions of employment;
4. Therefore information on the University’s approach to fixed-term employment should be made available as part of the recruitment process

Figure 2 Exemplar: Fixed Term Contracts, Contextual treatment

<table>
<thead>
<tr>
<th>Function</th>
<th>Human Resource Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>Recruitment</td>
</tr>
<tr>
<td>Task</td>
<td>Pre-recruitment</td>
</tr>
<tr>
<td>Sub-task</td>
<td>Authority to recruit</td>
</tr>
<tr>
<td></td>
<td>Fixed term contracts</td>
</tr>
<tr>
<td></td>
<td>Equal opportunities</td>
</tr>
<tr>
<td>Selection</td>
<td>Person specification / Job description templates</td>
</tr>
<tr>
<td>Appointment</td>
<td>Salary scales</td>
</tr>
<tr>
<td></td>
<td>Appointment forms</td>
</tr>
</tbody>
</table>

Unfortunately time does not allow for a full discussion of the anticipated benefits provided for by classification via function, activity, task, sub-task particular to improving the organisation of content and effective information retrieval from the University portal. The “primary uses of classification” presented by Shepherd and Yeo (2003), p.73 concisely articulate the utility of this method of arrangement. At this stage it is perhaps useful to also consider how classification can be applied to create new meaning through the establishment of relationships, and how this application can be utilised to generate business improvement.

Figure 3 The Primary Uses of Classification

- “providing links between records that originate from the same activity or from related activities”
- “determining where a record should be placed in a larger aggregation of records”
- “assisting users in retrieving records”
- “assisting users in interpreting records”

Shepherd and Yeo (2003), p.73

Contextual classification: revealing new meaning, supporting business improvement

As illustrated via the fixed-term contract exemplar: business performance can be adversely impacted where information is effectively lost or made inaccessible due to misclassification particularly where subsequent actions or decisions cannot be made
given the absence of materials to make informed decisions. Classification and organisation of content within an intranet and/or portal by function, activity, task, sub-task appears to be creating a highly logical (i.e. contextual) and accessible arrangement. Given the relatively constant nature of business functions and activities an element of future proofing is also introduced to the taxonomy.

I would like to briefly introduce another, and in my opinion an understated, attribute of classification. Classification also supports the creation of meaning (or if you wish revealing meaning that was always there) via the establishment of relationships. As noted earlier the groupings created via classification, can further understanding where a holistic overview of a process and/or area of business activity is provided e.g. collocating information on assessment and examination. However, **classifying to establish context can also support business improvements where additional meaning is created (or revealed) and communicated from the relationships, where the relevancy and role of information within a business context is established.** Again, referring to fixed-term contracts: many colleagues would not automatically see the relevancy of this material when presented as employment legislation. In the revised arrangement (Figure 2) material on fixed-term contracts is now associated with the business activity recruitment, and by default a new meaning has been established. This material exists to support the recruitment process and therefore should be acted upon when recruitment of staff is undertaken.

**Classifying to support the ‘learning organisation’**

Contextual classification provides additional opportunities to improve business performance beyond the provision of enhanced information retrieval. The potential to improve business performance via the creation of new meaning where the relevance and role of information, content or services are established via contextual classification should not be underestimated. Quality assurance functions within universities require the production of a range of annual reports. Such items are frequently published and left unread, as there is a belief that the job has been completed, an administrative function i.e. audit trail has been taken care of once the report has been written, approved and published. A significant factor underlying the production of these reports is to enable an organisation to learn from its mistakes and successes to generate improvement. In knowledge management terms the potential to learn from mistakes (and indeed successes) as a ‘learning organisation’ aspect can be easily lost within a bureaucracy. Contextual classifying and arrangement of these items acknowledging the quality enhancement element of such materials is likely to secure business improvements over time where this aspect of the annual report is recognised. Organising annual reports to create an audit trail, or placing information on the use of fixed-term contracts within employment legislation will result in mistakes being made and repeated, where the business context and/or purpose of the material is not fully understood or recognised or indeed revealed.

**Taxonomy development: a new strategic opportunity for records managers?**

The Freedom of Information (Scotland) Act 2002 was a catalyst securing implementation of a professional records management function at the University of Abertay Dundee. Understandably increased regulation is often perceived as an additional business cost and subsequently viewed as a threat, where resources are
diverted from supporting the organisation's core business. The close association (or if you wish contextual relationship) created between records management and Freedom of Information legislation is arguably not the most effective platform from which to pitch the business benefits of records management to an aggrieved senior management who may view FOI as a regulatory burden. I would imagine that in many quarters of the public sector senior management have felt reluctantly forced into a corner when asked to resource records management implementations.

The application of techniques used to develop business classification schemes have clearly demonstrated and articulated the contributions that records management can make as a business improvement tool within the context of taxonomy development. The business benefits of records management at the University are now more readily understood and accepted. The University previously accepted the business benefits of records management, albeit in a ‘back-office’ sense. Shepherd and Yeo (2003) p.51 make a distinction between “substantive” and “facilitative” functions: “…substantive functions that relate directly to the organization’s purpose [at Abertay teaching & learning must be considered substantive functions]. Others, such as administering the organization’s finances or property are facilitative functions, providing the infrastructure that enables the substantive functions to proceed.” Arguably records management is most likely to operate as a “facilitative function”; however the key to survival is to ensure that it can operate at a level, which supports and enhances organisational development.

Demonstrating the application of records management techniques to taxonomy development has been a significant opportunity: aligning records management techniques to improving areas of core business activity. Working to apply records 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 their enhancement of the student/staff experience. Here the taxonomy in effect acts as an interface between the user and the corporate information, resources and services the University produces and maintains to support teaching and learning. Senior managers appreciate the role of records retention schedules, and protecting vital records. However, this “facilitative activity” is viewed as a utility i.e. this provision is expected to be developed and made available to the business. Utilising records management techniques to influence and direct the development of “substantive” business functions is likely to ensure that support for records management is sustained after the impact of Freedom of Information has dissipated.

**Conclusions**

The librarianship profession has been active in advocating the role of classification as a tool to create taxonomies to underpin the effective management of corporate information, particularly within portal and/or intranet environments. In my opinion, the role of the records manager in taxonomy development is very much understated; indeed this connection is rarely made. Unfortunately when classification is discussed in standard records management texts such as Shepherd and Yeo (2003), the potential

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4 It should also be considered that where records management is embedded within all organisational functions the distinction between substantive and facilitative functions largely becomes irrelevant.
to transfer information organisation techniques used to develop business classification schemes to portals, intranets and taxonomies does not appear to be acknowledged. I believe this is a lost opportunity considering the powerful potential of the contextual classification philosophy, which is central to records management. Based on recent experiences at Abertay, I believe that the application of techniques and skills used to develop business classification schemes to be highly relevant concerning the development of taxonomies to underpin portal and/or intranet development. Classification and organisation of content by function, activity, task, sub-task is producing a highly effective primary taxonomy. From an organisational perspective initially librarianship provided the general direction in tackling taxonomy development. However, it was not until the contextual classification approach advocated by records managers was investigated and assessed that an adequate solution emerged. Contextual classification has also produced a number of positive outcomes beyond the logical grouping of content, in particular the potential to generate and/or reinforce meaning. As noted earlier this can aid organisational learning for example where annual reports are presented in the context of quality enhancement (i.e. reinforcing the learning aspects of utilising annual reports to build on successes and/or failures) as opposed to a being organised and presented in a manner which suggests the completion of an annual bureaucratic cycle.

It is clear that taxonomy development and allied areas of activity required to build and develop information architectures are heavily dependent upon the philosophies, principles and techniques allied to information retrieval. As we continue the journey towards a knowledge economy in many respects effective information retrieval has re-emerged as a core business area for the informational professional. Surely working in partnership across disciplines is key to helping ensure that we are all successful in our endeavours. Indeed, are we now entering a phase where elements of the subject area of information retrieval require to be re-visited and re-written encompassing approaches across the information profession as a whole, as opposed to presenting the subject from the perspective of librarianship and records management silos? Furthermore and perhaps equally important, how do we ensure that we successfully train and inspire future generations of information professionals to be proficient in the discipline of information retrieval?

Finally, there is little doubt that Freedom of Information has emerged as a powerful catalyst, encouraging the development of records management functions throughout the public sector. I believe that it is unlikely that FOI alone will sustain senior management support of records management functions in the medium to long term. If we are called upon to re-assert the value of records management to our paymasters, or indeed other enquirers the role of information retrieval in sustaining improvements in the management of corporate information surely should form part of our response. Reflecting on the response to records management within my own workplace. Perceptions have evolved and the impact of records management has been heightened given the
contribution of contextual classification towards taxonomy development. Previously records management was viewed in many quarters as an administrative albeit accepted function. Now records management is viewed as a contributory element in improving the effectiveness of the organisation. In the foreseeable future, it is likely that records management work at Abertay will focus on enhancement of the student experience by improving the underlying organisation of the University portal.
References


