this mean for both the indexing and for that small group of experts?

Table 1 reviews user tagging against ANZSI's description of the work of a professional indexer in 'Who we are and what we do' (www.anzsi.org/administration/about AusSI.htm). It is not difficult to see relationships between tagging and indexing as it is defined in this way.

Folksonomy

One major difference between professional indexing and the tagging taking place in Web 2.0 is that indexing generally involves use of a controlled vocabulary, taxonomy or thesaurus, while social tagging is much less likely to employ such a tool. This distinction is not obvious from the description of the professional indexer used above, but I believe it is one area that warrants further attention. How important to findability and usability is the consistency of description strived for by the use of an authoritative, controlled vocabulary as opposed to the user-specified terms employed in social tagging systems?

Folksonomy is a term used to refer to 'user-generated classification associating keywords with content' (e-government Victoria, nd). The term has obviously derived from the concept of taxonomy, and the idea of a vocabulary that develops from a particular community of users, rather than an external authority. A simple example of where folksonomy is employed effectively is Attendr (www.attendr.com), where users agree on a tag to use for a conference in order to gather all participants' online activity and comments around the conference.

Research into the relative quality and applicability of user tagging, reviewing and rating is limited, not surprisingly given the relatively recent advent of this activity. There are some interesting applications such as Google Image Labeler (http://images.google.com/imagelabeler/), which aim to improve the quality of tagging. Users are randomly paired with an online partner and over a 90-second period, both are shown the same set of images and asked to provide as many labels as possible to describe each image. When both partners provide the same label this is considered to be a representative tag which should be added for that image.

LibraryThing (www.librarything.com) is a special case which combines the two worlds of MARC catalogue records and social tagging to provide an enhanced cataloguing and community service centred on books. Perhaps this service could be a source of data about the relative merits or effectiveness of controlled vocabulary terms and user tagging, by comparing the relevance of hits returned from catalogue terms with those returned from user tags. Such research is vital for informing future information architecture and allocation of resources to improving indexing, thesaurus development and search. Questions that arise include what do folksonomies have to offer thesaurus developers and indexers, and what does a thesaurus like ScOT have to offer social tagging?

Taxonomy-directed folksonomy

This last question was addressed as part of an edna personalization project, by Nick Lothian, technical architect at Education.au, who developed a proof of concept for what he calls a taxonomy-directed folksonomy (Lothian, 2006). This was an attempt to combine a taxonomy, in this case the ScOT thesaurus, with user tagging. When tagging a resource the user was shown appropriate terms from the thesaurus in the hope that if a term shown met their needs, they would select a term from the thesaurus over a non-preferred version which they might have used had the thesaurus term not been 'in their face'. Of course, if the thesaurus term does not meet the user's need, they can continue to input their preferred term. The benefits that a thesaurus provides in terms of broader, narrower and related terms could be passed on to the user, and hopefully the use of non-preferred terms would be reduced. It was then envisaged that thesaurus managers could review the terms contributed by users where an appropriate thesaurus term was not found, and use this information to improve their thesaurus.

RSS: Subscription as alternative to search

Another keystone in Web 2.0 architecture is content delivery via RSS. RSS stands for Rich site/Really simple syndication, and enables users to subscribe to online content and have it delivered to their desktop. By subscribing to services that provide content that is regularly updated such as news, events, music or episodes of a radio or television programme, users keep up to date with their chosen topic or show. In addition to the immediacy benefits of this functionality, and the personalization it offers, there are also major impacts in terms of resource discovery. Users can subscribe to tags or keywords to further customize the content they receive. This represents a convenient alternative to searching for content, particularly for topics where the user wishes to keep abreast of new developments and content over time.

For this user, there is an assumption that the tag they have chosen to track is in fact a representative enough term to produce a comprehensive set of results. While this may work well for an agreed folksonomy term such as the tag for a conference, for more general topics subscription via RSS usually involves elaborate search syntax, subscription to multiple feeds to cover all bases or restriction of feeds to tags from trusted colleagues only. This is a case where wider use of a controlled vocabulary would be highly beneficial to improve the probability that the term subscribed to will return highly relevant and usable content.

The future: Indexing 2.0

One intention of this paper in considering the key elements of information architecture in an online information service such as edna, and tracking changes over the past ten years, was to consider or predict what might be key elements of online information architecture in the future. It seems that more questions than answers have been generated in consid-

ering what implications this has for our work, and where we go from here. While the paper has concentrated on Web 2.0 and the possible impact of user tagging on the future of indexing, it is important to acknowledge also the potential of automated processes to dramatically change indexing and information architecture in the future. Browne (2007) describes this as a 'decrease in human indexing and rise in Machine-Aided Indexing (MAI), in fully automated indexing and in the absence of indexing (replaced by free-text, full-text search)'. Comparing the usability and findability of this machine-generated from full-text format versus the more traditional human indexed metadata format is one more area requiring ongoing research. The US Presidential Speeches site (Mehta, 2007) is an interesting example where tag clouds generated by largely automated machine indexing of text are 'mashed-up' in a timeline format and presented in a highly visual manner, creating a completely new and extremely powerful information product for history students.

The challenge I am left with is how we create a future where large-scale creative and functional online services are developed that combine the best of each of these approaches to indexing. This means the ease, power and speed of the automated indexer plus the high quality, value-added and standards-focused data returned by the professional human indexer, as well as the user-centred, popular terminology of the social tagger.

Acknowledgement

Notes

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2 EdNA metadata standard 1.1 2002, Education.au www.edna.edu.au/edna/go/resources/metadata/pid/261
3 Learning architecture framework 2003, MCEETYA, www.mceetya.edu.au/verve/_resources/25aagenda.pdf
4 See 'What is a Learning Object' The Le@rning Federation FAQ, www.thelearningfederation.edu.au/faqs.html#What_is_a_learning_object_
5 ANZ-LOM Metadata Application Profile, Curriculum Corporation, www.thelearningfederation.edu.au/verve/_resources/ANZ-LOM.pdf
6 ERIC: Education Resources Information Center, Institute of Education Science, US Department of Education, www.eric.ed.gov/
7 For further discussion of this phenomenon, see Bill Johncocks' article, Web 2 and users' expectations of indexes, in the March 2008 *Indexer* (*Indexer* **26**(1): 18).
8 See, e.g., http://wordnet.princeton.edu/perl/webwn/

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