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# Reference in the Digital Age: Science, Art or Shot in the Dark?

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Reference librarians are currently faced with an significant change in the information gathering practices of their users. It is clear that information seekers like their information digitised and demand it in quantities that were never evident when they were relying upon libraries. For example, according to one recent estimate Google receives more reference questions in 36 hours, than all the reference libraries in the United States will receive in a full year (Quint, 2002).

An even more startling statistic, however, is that provided by the Ellis Island website in the United States. Ellis Island being of course for many years the reception point for immigrants to the USA. When its website consisting of immigration records was first launched, it received 26 million queries in the first 54 minutes, which translates to some 27,000 per second (Johnson, 2002).

Clearly, information in a digitised form is attracting new information seekers. Individuals who may have little or no experience of using reference and information services provided by libraries, are attracted to using the various services made available on the internet.

I want to discuss these developments by asking whether information seeking in the digital age is a science, an art, or a shot in the dark. The quick answer, I think, is that is undeniably all three. The challenge is to understand what that implies for the future development of reference services.

## Science

So firstly, for whom is reference a science?

Clearly the work of 'reference' is a science for those who construct the bibliographic and other databases that continue to underpin much reference work. They deal in the hard end of information systems that enable the development of the fields, tags, indexing languages, search interfaces and retrieval algorithms on which much reference work depends.

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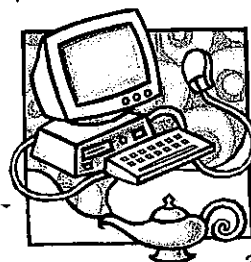
It is the outcome of their 'science' to build information retrieval systems and databases that will hopefully make possible that magic mixture of recall and precision which will mean that all relevant items on a database will be retrieved and all noise eliminated.

We can get a sense of their interests by scanning some titles of recent articles that have appeared in the *Journal of the American Society for Information Science and Technology*.

- 'Order-based fitness functions for genetic algorithms applied to relevance feedback'
- 'Rotation and scale invariant wavelet feature for content-based texture image retrieval'
- 'Implementing relevance feedback in the Bayesian Network Retrieval model'

As with many – indeed presumably most – reference librarians, I am not likely to be attracted to reading any of these articles. And even if I were, there are probably very few that I could read with a high level of understanding.

Starting with the printed bibliographic and reference tools which preceded digital information sources, information retrieval and systems experts took many of the same basic elements of descriptive and subject bibliography and automated them. Working with the power of what computers do better than anything else,



indeed the only thing computers are capable of doing – recognising specified strings of characters – they transformed the work of reference librarians and the information seeking habits of library users.

How successful has their science been? I think we can at least say that they built information retrieval systems that are fast and efficient replacements for their print predecessors, and in some cases they have managed to use the power of the computer to add value to the search experience.

Information scientists designing databases for a library market have probably been less successful at producing systems that were effective in the sense of being attractive or seductive to end users. The concept of 'user friendliness' was not one that information scientists were too concerned about – initially at least. This was because the technology we now understand to be necessary to support user-friendly information systems – such as

- graphical user interfaces,
- drop down menus,
- elaborate use of hypertext,
- high colour resolution, and
- attractive and intuitive design

simply did not exist. And in a sense the concept of the 'user' was also foreign, at least in the sense of end-user. With librarians working as intermediaries the science could be turned towards the goal of building information retrieval systems for use by information professionals.

In more recent years there has been additional stress placed on meeting the needs of an end-user audience, but as we shall see, there is still a gap between what constitutes 'user-friendly' in a library situation, and the levels of user orientation available on other types of sites.

### Art

Reference librarians, however, do not practice science. That is, most if not all reference librarians would agree that their job entails substantially more than using the carefully structured databases and the search engines that we have at our disposal.

In part, this is because reference librarians very soon come to realise the limitations of even the most effective retrieval systems. Indexing effectiveness is limited by numerous issues, including;

- the natural limitations of any indexing language or set of subject headings,
- the mismatch between understanding of concepts that inevitably exist between indexer and user,

- developing fields of study which produce shifting concepts and an evolving terminology used to describe those concepts,
- the inevitable limitations on the number of indexing terms that can be applied to complex subject material,
- the further complexity of relationships between topics which cannot be expressed by using Boolean functionality.

In other words information science has failed to produce the level of exactness or comprehensiveness required in many situations for highly effective information retrieval or reference work.

In these circumstances, the reference librarian, or indeed the skilled end-user is left to develop the *art* of information retrieval. They are usually prepared to harness the science in the service of their art, but they are also well aware of the limitations of the science and the extent to which they need to develop complementary skills.

The exact nature of these skills is difficult to describe or define. Exactly what skills are required to make a good reference librarian? There is of course the range of interpersonal and communication skills which are fundamental to the reference process, but the range of desirable 'personal' skills also extend to the information retrieval process itself. That is, it is essential to understand the limits of the science and the point at which the science should give way to the art.

And how do we describe this art? Phrases such as lateral thinking, thinking outside the square, and right-brain reasoning all come to mind. Sometimes it is just a good mixture of intelligence, common sense and experience, but often it is also a little more than that.

Good reference librarians possess some intuitive understandings of information and its ways. It is not too



far-fetched to speak about an 'x' factor which separates the competent reference librarian from the highly skilled. And I suggest that it is this 'x' factor which allows the skilled reference librarian to work effectively beyond the limitations of the information retrieval systems.

### Shot in the Dark

Who then practices the shot in the dark? Well it will come as no surprise to you, that this reference is, in the first place at least, to the information retrieval habits of our end-users. It is perhaps not surprising that for the most part, neither the science nor the art of reference librarianship mean much to them.

There has of course been a vast amount of research undertaken on the information retrieval habits of users in both pre-digital and digital environments. Even if you haven't read any of the research, I am sure that you are generally familiar with its conclusions; that is, that end-users are indifferent to the many efforts that have been made on their behalf to create accurate, comprehensive and systematic information retrieval tools. As Griffiths and Brophy (2002) recently concluded

a number of studies have shown that users will often trade performance for the path of least cognitive resistance.

That is, they want to minimise both effort and time.

Of course their interests in this regard have been served by the wide availability of the Internet, the development of the world wide web, and the implementation of the massive retrieval capacity of favoured search engines, in particular Google.

The key here, is the keyword search. The keyword search was enticing in library online catalogues, but it is irresistible when searching the web. Web searchers using keyword access find they inevitably get a result, frequently extending to tens or hundreds of thousands of web pages, and all (supposedly) ranked in order of relevance.

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Some recent research undertaken on behalf of OCLC (Online Computer Library Center, 2002) and aimed at assessing aspects of students' web use in the US, determined that the characteristics the respondents most associated with the web was that the 'web is easy to use' and that the 'web is self-service'. Other responses indicated that students are aware of the shortcomings of web based research, including those related to accuracy and identifying intellectual responsibility. There was little indication, however, that these negative factors deter use. Ease of access drove their use of the Internet as their information retrieval tool of first choice.

Experienced reference librarians are often suspicious – or even scathing – of web based subject searching. After all, it flies in the face of our own practice and training. The keyword web search, the 'shot in the dark', negates not only the advantages of the carefully structured science of information retrieval, but also eliminates the art of reference work.

In other words, librarians often support the view that users are 'lazy' in their information seeking habits. Although that is of course a rather pejorative expression to apply to users, who are after all, simply making a judgment – informed by previous experience – as to where their own best interests lie.

It is also important to note that research indicating that users prefer a 'path of least resistance' approach pre-dates the Internet or the world wide web. Users have always chosen the easy way in their information seeking, and it will almost certainly remain the case. And I suspect that it is also true of trained information seekers.

The first question I am likely to ask myself when faced with an information seeking task, is not, 'where can I get the most thorough information on this subject?', or 'which is the most authoritative source available on this topic', but rather 'how can I find this as quickly as possible?'. What we are dealing with here is human nature, not some puzzling or unexpected

resistance to the use of carefully structured and executed information retrieval strategies.

So I believe that it is fairly clear as to why users are irresistibly drawn to the keyword search. Firstly, it is often all that they understand of the search process. While the concepts of search fields, indexing languages and Boolean logic may seem obvious to trained and experienced users, it is not always easy to persuade users of their value, particularly when they seem to get an equally impressive result, in numerical terms at least, by simply putting in a few key terms. And secondly, because it is easy, requiring little effort or thought, and with no need to deal with the mental challenge of having to construct an accurate search strategy.

What I would like to suggest, however, is that it may be to our detriment if we believe that ignorance and laziness alone account for this preference. That is, it is worth considering whether one of the reasons why users prefer the keyword approach is because it offers just that feature that the developers of information retrieval systems do their best to eliminate – the element of 'chance'. It could well be, that many information seekers value the error factor, as a way of introducing a certain randomness, and even luck, into their information retrieval.

We are of course all familiar with the concept of serendipitous searching, and some of us may even claim – perhaps jokingly – that it is part of our repertoire as an experienced information seeker. What we are referring to by use of the term 'serendipity' is the skill and experience born of many years of practice, which allow us to take a sometimes intuitive approach to the task of information retrieval. In other words, it is closely aligned to the 'art' of reference work.

In those moments when we recognise the power of serendipity we are acknowledging the limitations to the science, and expressing our understanding that there are subtle and even mysterious ways in which an ounce of judiciously applied nous—or even luck—can sometimes be

worth a ton of science. Perhaps our users also understand this either instinctively or through experience. Just as they frequently preferred browsing in the pre-digital era, they may now prefer 'surfing' for information, rather than following the requirements of structured systems they barely understand.

There has been a spate of research in recent years into the aspect of chance or serendipity in the information retrieval process, and a growing awareness of its potential real value (Williamson, 1998; Ford, 1999; Ross, 1999; Toms, 2000). As one recent assessment (Nicholas *et al*, 2003, 28) of information seeking styles concluded;

...a lot of information is collected by unconventional, unusual or serendipitous means. Thus, maybe, what is seen as minimalist and idiosyncratic information behaviour is not so odd, strange, etc after all – maybe it is just creative. Certainly this kind of behaviour is more in tune with the thinking of Google than Dialog.

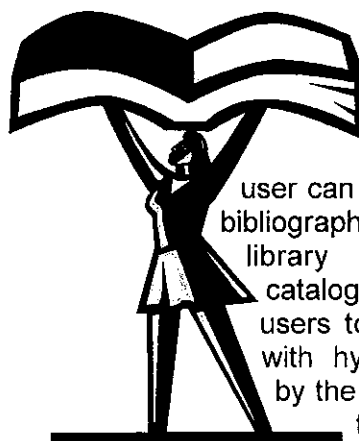
Some of the research and speculation that has taken place around serendipity (Ford, 1999) has stressed that it is information encounters that take place in just this way that result in the most creative and adventurous discoveries. That is, information which is set loose from its usual contexts and expected contiguities, will lead to the most creative outcomes and insights.

I think we could also speculate that reference librarians are inhibited by the assumption that users are looking for quite specific information (ie the emphasis in the reference interview is to find out what the user 'really wants') when often information seeking is very non-specific. The user may be wanting 'some information' about a topic that is poorly defined, poorly understood, or perhaps not even acknowledged as being a subject of information need.

While reference librarians might acknowledge the value of serendipity in their own work, they are loathe to encourage its 'use' by information seekers.

I referred earlier to some research conducted by OCLC on the web use habits of a group of US students. At the conclusion of the report they provided a list of 'Questions for further exploration and discussion', one of which was, 'Can librarians create a customer-friendly experience to match the best merchants and consumer websites?' (Online Computer Library Center, 2002, 11) It is an interesting question, and one worth briefly exploring, because it might provide some pointers to how we might best marry the science, the art, and the shot in the dark.

This can be done by referring to a model Internet site, that maintained by Amazon.com. Amazon is a particularly suitable choice, because as has recently been noted 'Amazon.com is used by many in lieu of public access catalogs' (Kenney *et al*, 2003). Why might this be the case? A simple test might answer the question.



Using almost any title retrieved from Amazon.com, the user can very easily verify the bibliographic details as in any library catalogue. Library catalogues would also allow users to easily check, often with hypertext links, books by the same author, or with the same limited

range of subject headings. On some of the more sophisticated systems it would also be possible to check for items which are shelved immediately adjacent.

If we compare that to Amazon.com, we will find that this site offers a range of additional features, typically including;

- a list of titles also purchased by customers who bought the retrieved item;
- a separate list of authors who wrote books which were also purchased by buyers of the retrieved item;
- Numerous sample pages of the book in full text 'pdf' scans, including the

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front cover, the back cover; the full index and contents pages, and excerpts from the text;

- a range of reviews of the book from reputable reviewing journals;
- reviews from customers who have purchased and used the book;
- a series of bibliographies on related topics;
- numerous subject access points.

Wherever appropriate, these access points encourage surfing or investigation via hypertext links. The page is also interactive, with users being able to post their own thoughts or reviews about the book. Needless to say, the pages are designed in a way which is intended to engage the user's interest and curiosity; they are energetic, highly coloured, densely filled – very unlike library catalogues.

A crucial element in the attractiveness of websites, such as Amazon.com, is the promise of the serendipitous moment. Using the logic of curiosity, the power of hypertext, and lure of the shopping trolley, the creators of the website have masterminded an information retrieval tool which goes some way to harnessing the power of serendipity and matching it with the user's curiosity. If users prefer to use Amazon.com as a catalogue, rather than online library catalogues, it may well be because it is a better 'catalogue' for their purposes.

What can be done to introduce the power of serendipity into the modern reference service? One suggestion is to bring about a marriage between the science of creating information retrieval systems and serendipity. As Toms (2000) has noted;

Serendipitous retrieval demands approaching information retrieval in an unorthodox manner, one that does not tightly couple the explicit match of query with result, but instead takes a fuzzy approach to the problem.

Toms (2000) has also suggested that similar activity should also be occurring at the level of the individual library.

In addition to supporting the typical information retrieval tasks, a digital

library must also support these types of activities (ie serendipity) just as generations of physical libraries have by accident supported serendipitous interactions merely through the juxtaposition of books on a shelf. A digital library must stimulate curiosity and encourage exploration so that users may make opportune discoveries.

Exactly how this might happen, Toms does not explain. Perhaps one way might be through the imaginative development of library websites and subject portals. It would seem at present that most libraries are favouring tightly-structured forms of digital access, that build upon strict hierarchies of knowledge and formalised understandings of the relationships between subjects.

Another important step, however, may be for reference librarians to acknowledge that users share some of their artfulness. The use of keywords, while perhaps being a shot in the dark, might not necessarily be a misfire. They may represent a perfectly reasonable and productive response to an information need. The science and the art of information retrieval remain paramount, but the sensible reference librarian will admit to the value of the occasional shot in the dark.

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## READING AT MONASTIC MEALS

Dom Michael Tunney

New Norcia

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*Prior to becoming a monk of New Norcia (in 2001) he was a clinical psychologist with Department of Health in Western Australia.*

*He is the single parent of Claire, a gifted cellist living in Germany.*

I've been asked to speak briefly about the reading that accompanies the meals in the monastery refectory. I'll comment on three aspects of this:

- a. the organization and content of these readings
- b. some recent and current books, and
- c. the purpose of these readings.

The monks meet for a main meal at lunch and a light supper each day, both of which are taken in silence with readings. Breakfast is eaten alone and in silence.

We will visit the refectory on the tour. It is an attractive room, furnished and arranged in the traditional monastic style that you would see in monasteries of either monks or nuns anywhere in the world.

At each meal Scripture is read during the first course, which is soup and bread. At lunch this Scripture reading is from the Old Testament, and at supper from the New Testament. These are continuous

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