

‘Speaking the same language: using controlled vocabularies to search museum collections databases’

by

Emma Chapman

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Victoria University of Wellington
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Table of Contents

Abstract	4
Research problem	4
Methodology	4
Results.....	4
Implications	4
Introduction.....	5
Definitions	6
<i>Fig 1: Controlled terms.....</i>	<i>6</i>
Problem statement.....	8
Literature Review	10
Cataloguing collections.....	10
Negative views.....	11
Positive views.....	12
User preferences	12
Studies of controlled vocabularies in archives and museums	12
Summary.....	13
Rationale for study	15
Research questions	15
Questions.....	15
Research frameworks.....	16
<i>Fig 2: Dimensions of Cognitive Work Analysis (from Mai, 2008)</i>	<i>16</i>
Research methods.....	18
Sample	18
Data collection	18
Limitations of study	19
Data analysis.....	20
Why search?	20
What databases?	20
<i>Fig 3: Databases searched</i>	<i>21</i>
What controlled terms?.....	21
<i>Fig 4: Controlled terms in the databases.</i>	<i>21</i>
<i>Fig. 5: Controlled terms in the database by theme</i>	<i>22</i>
Sources of controlled terms.....	23
<i>Fig 6: Sources of controlled terms.....</i>	<i>23</i>
Knowledge of controlled terms	24
Factors influencing use of controlled terms when searching.....	24
Collections staff perceptions of controlled vocabularies.....	26
How well do they describe the collection?.....	26
What are the problems with using controlled terms when searching?.....	27
Are they helpful?	28
Controlled terms roles in accessing collections	29
Discussion.....	30

Specificity + Accuracy + Consistency = Trust.....	30
Experience + Training + Peer support = Knowledge	30
Conclusion	33
References.....	34
Appendices	37
Appendix 1: Interview questions outline	37
Appendix 2: Interview Cover Letter	38

Abstract

Research problem

This study set out to see how controlled vocabularies help people find collections materials in electronic museum databases.

Methodology

It did this by interviewing collections staff from four museums. Eight people from library and non-library work areas at the four museums, who regularly search a museum database in the course of their work, were asked about their experiences with using controlled vocabularies to search.

Results

How people used controlled terms depended upon their job tasks and upon their knowledge of terms, past experience and training, and whether they trusted that terms would deliver good search results. Difficulties in using them were identified as being to do with terms themselves; the knowledge of the person searching; and the quality of information in the database. Despite controlled terms rarely being used alone for searching, respondents considered that controlled terminologies are important tools within museum databases for accessing collections.

Implications

Controlled terms are resource intensive and need institutional backing to work well. Peer support, formal training, staff with database and controlled terms experience, and access to terms lists are some specific factors that would assist controlled vocabularies to work better for the people who search museum databases. Museums need to allocate sufficient financial and administrative resources to controlled terms, if they are serious about improving access to their collections.

Introduction

Existing research and literature relates how controlled vocabularies assist with finding materials in large databases. It also discusses limitations of controlled vocabularies, particularly those that represent subjects and concepts. However most of the literature is focussed upon library catalogues and systems. The museum community, especially in New Zealand, is not well represented in the literature.

The museum community is diverse, and museum databases must describe diverse materials. This poses potential problems and complicates assigning controlled terms: subsequently there may be challenges with searching and accessing records.

This study responded to a problem articulated by a collections staff member about using terms to find materials in her museum's database. She was concerned that she was not using the correct search terms so was missing relevant catalogued materials in the database. The study explored how controlled vocabularies are used as search tools in museum databases, and what the people who used them thought about them as search tools.

The study found that museums' electronic databases/collection management systems all contained at least some fields with controlled terms which people found useful to limit searches. How people used controlled terms depended upon contextual and personal factors including the information in the database, terminologies themselves, personal experience, and individual preference. These results aligned with literature on controlled vocabularies. People thought controlled terminologies could be useful for helping to share museum collections in the future, but that required time and skill to implement properly.

Definitions

Controlled vocabulary - “a pre-determined list of terms relevant to a particular domain, which can be hierarchically structured and contain lots of interesting relationships” (MacKenzie-Robb, 2010).

Controlled vocabularies may be entered in to controlled fields in a database - these require people to select from a list of terms when entering data into database fields and thus control data entry and contain structured and predictable data. (Vernon 2011). May be called a thesaurus, an authority list, a subject list, a subject dictionary.¹ All terms together are discussed as “controlled terms”.²

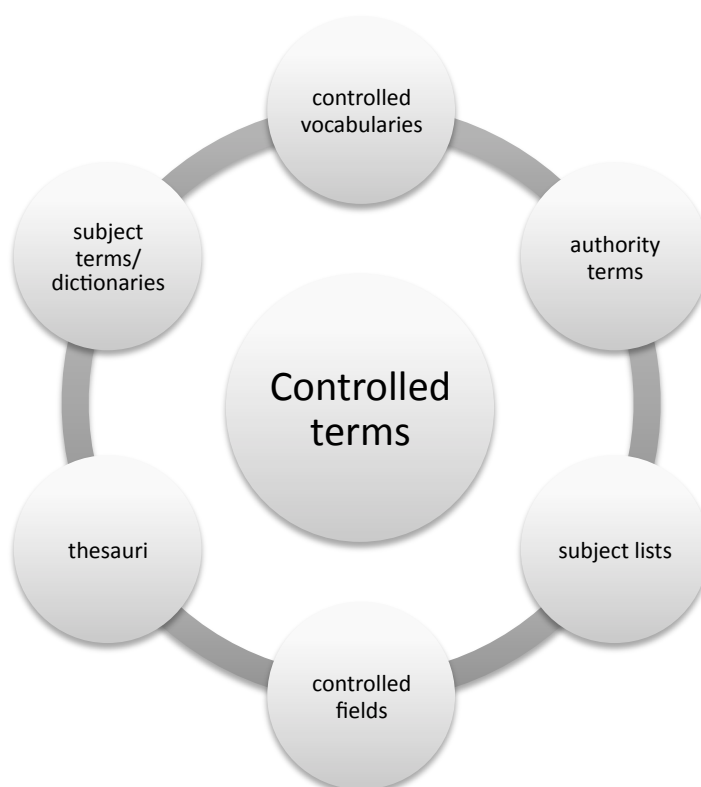


Fig 1: Controlled terms

¹ While many people may think of controlled vocabularies as primarily subject terms lists, in this study other authority terms such as places and names are included.

² In this study, some respondents also entered terms from a reputable source into non-controlled database fields – these are included in the discussion as controlled vocabularies, although they are not controlled in database terms.

Museum collection management system (CMS) – a specialised database for electronic documentation of museum collections.

Collections staff – Broadly, people who work in the museum collections area. In the context of this research, this included a curator, collection personnel, exhibitions researchers, archivists, and librarians.³ Those people interviewed worked with collections and regularly and currently performed searches in the museum database or CMS in the course of their work.⁴

Subject search – Searching using terms from a subject vocabulary (a pre-set list of terms). Also may mean searching only the subject field of a database (unlike full-text searching).

Keyword search – Searching using terms that are not pre-set. Usually searches the full-text of the document or record.

Tagging – Adding a keyword to describe an object or information source, to assist personal retrieval.

Folksonomy – a system of classification that comes from tagging of information in a social environment (Vander Wal, 2007).

Small museum – 1-5 full time paid staff (not represented in this study).

Medium museum – 6-20 full time paid staff.

Large museum – Over 20 full time paid staff. (Legget, 2007)

³ NZ Museums' Barometer No. 2 (2007) suggested "a lack of consistency across the museum sector in terms of job titles and scope of responsibility" which was reflected in the experiences of this study: no two people had exactly the same job title or job tasks. Also, NZ Museums Barometer No. 3 (2009) found that "The top four categories contained within the collections are photographs (10%), books and printed material (10%), social history (9%), archives and manuscripts (9%)." This places librarians clearly within the "collection staff" category.

⁴ Non-users (people who perhaps should use the CMS but do not) were beyond the scope of this study. Similarly, people who have visited museums to use collections for research (but do not work there) are outside of the study scope.

Problem statement

“We are worried that we will miss things in our collection because we are searching for them using the wrong terms.” (Collections staff at medium-sized New Zealand museum)

Is this problem common? Would controlled vocabularies help solve it and so improve access to collections?

Diversity marks the museum community. There are 400 museums listed on the NZ Museums website: this is a conservative estimate of numbers (Legget, 2007). Museums may collect many things – from art to automobiles to animals.

Within organisations, diversity also reigns. People from many disciplines work at describing a museum’s collection; people from many communities of practice (for example, curators in science, history, technology, art; archivists, or librarians) bring different language and conceptual expectations to their cataloguing and descriptions of materials in the collection. People entering data may have different levels of experience with databases and with use of controlled vocabularies and authority lists. All of this means that application of controlled vocabularies may vary within an institution. In the course of their work, museum professionals may need to search for materials outside of their immediate area of expertise, thus entering unfamiliar subject terminology territory.

Most museum databases offer controlled vocabulary functions. But although many in the museums community realise the value of standards and consistency in terminology, not all museums may have the resources (staff time, experience) to implement such standards.

In the light of this diversity this research focussed on language use in searching, studying to what extent people used controlled vocabularies when searching their museum CMS or database.

The use of controlled vocabularies for searching implies several things:

- The searcher has knowledge of authorised or preferred vocabulary terms, or has access to term lists;
- The searcher has trust and confidence that controlled vocabulary terms adequately describe materials they seek and are effective tools for accessing data;
- Controlled terms may be integrated into the CMS or database;
- There is institutional support for their use through staff time and training;
- Even possibly that there is awareness that these are a step towards sharing information with others.

This user study of controlled vocabulary searching in museum databases gave an idea of how controlled terms are currently utilised, and ideas for improving access to records in collections databases.

Preliminary questions:

- Are museum collection staff accessing their own collections assisted by common terminology values such as controlled vocabularies?
- Are museum collections staff in agreement on the usefulness of controlled vocabularies?
- Do people think other ways to search are better?
- If so, what are they doing and why do they think it is better?

Literature Review

Cataloguing collections

In museums, the advent of electronic CMSs has had an impact upon the use of controlled vocabularies. When records are on a database, searching is improved and knowledge about the collections is potentially enhanced. Controlled terms prevent incorrect spellings and variations in descriptions of materials. They thus help with finding things in the database. Opinion is that controlled vocabularies, thesauri and language are important in several respects. These include overcoming terminology differences for people attempting to retrieve information in electronic museum databases; increasing access to information about museum collections to diverse audiences; and for accessing collections and sharing content, even of objects not on display (Coburn & Baca, 2004; Duff & Sanderson, 2011; Sherwood, 1998). Best practice recommendations for museums that wish to have accessible collections involves (in part) the use of controlled terms for describing objects in the museum database. For example, Cataloguing Cultural Objects (CCO) is a data content standard for museums which recommends the use of controlled vocabularies ("10 Key Concepts - CCO Commons - Cataloging Cultural Objects," 2006).

Many vocabulary standards are used by museums, depending on what is being described. The Getty vocabularies are well known – these are the Art and Architecture Thesaurus (AAT), the Thesaurus of Geographic Names (TGN), the Union List of Artists Names (ULAN), and for introduction in 2011, the Cultural Objects Name Authority (CONA) ("Getty Vocabularies (Getty Research Institute)," 2010). A major controlled vocabulary source used by libraries, archives and museums to describe bibliographic materials is the Library of Congress Subject Headings (LCSH) ("Cataloging and Acquisitions (Library of Congress)," 2011). A controlled vocabulary used for classifying man-made objects in a museum collection is Chenhall's Revised Nomenclature (mentioned on the NISO website (Harpring, 2010; NISO, 2008)).

A recent study on features of museum CMSs notes that many have built in thesauri or options to install controlled vocabularies (Carpinone, 2010). Many CMSs allow users to build their own authority lists and dictionaries. For example, Vernon CMS is widely used in New Zealand. This CMS offers Getty's Art and Architecture Thesaurus and Chenhall's Revised Nomenclature as controlled vocabulary add-ons to the CMS, and also offers functions that allow users to build authority files for things such as names, places or events (Vernon Systems, 2011).

Some museums develop in-house thesauri in response to their own needs. The National Maritime Museum at Greenwich has in-house thesauri based upon terminology standards from library, archive and museums. They hope this will improve access to their collections (Lafferty, 2009). The Integrated Museum and Archives System of Singapore experimented with developing their own taxonomy, hoping to facilitate discovery of resources (Chaudhry and Jiun 2005). User testing was not undertaken in these cases. However, in 1995, the Powerhouse Museum (of Sydney, Australia) developed the Powerhouse Object Name Thesaurus, aiming to provide Australian terms for objects (Powerhouse Museum, 2009). This is

continually being developed. It is used in the Australian Museum Metadata exchange project, and latest news is that it will be available to New Zealand museums (Chan, 2011; NZ Museums, 2012).

Other search possibilities are mooted and being investigated by researchers in system design. Some methods involve semantic searching whereby systems match terms to those of similar meaning, or systems recommend alternative terms to those entered by the searcher. Possibilities such as tagging and folksonomies are suggested as alternates to controlled vocabularies, as these allow the representation of multiple worldviews (Mai, 2011; Shirky, 2005).

30% of museums in New Zealand have documented over 90% of their collections electronically. (New Zealand Tourism Research Institute, 2009). However, collections departments of museums are notoriously under-resourced, and many museums struggle to get more than basic records into their databases (Ibid.).

Negative views

There is a compelling argument that controlled vocabularies may not adequately represent subjects, and can give advantage to some ways of thinking at the expense of others (Bowker & Star, 1999, p. 257). Mai observes it is almost impossible to celebrate a plurality of viewpoints with consistent language while Shirky noted datedness: the Dewey decimal system has 7 categories for Christian religion and two that may represent others (Mai, 2011; Shirky, 2005). In practice, in the face of extreme diversity of formats in a Harvard University visual image project, a single controlled vocabulary was impractical (Wendler, 2004). Respondents in a study on controlled vocabularies in UK archives noted American bias of the Getty Geographic Thesaurus and American spellings in Library of Congress Subject headings (Fenton, 2010).

Perhaps because of the difficulty with representation of diverse views, one researcher found that many museum curators and archaeologists had a negative view of controlled vocabularies. Doerr (2009) observed when developing the CIDOC-CRM standard that people working in different disciplines (art, history, sciences) use multiple vocabularies and terminologies; but even within disciplines experts are often reluctant to develop standard ontologies and subject terms (Doerr, 2009). If this is correct it is not surprising that conflicting vocabularies are a major problem facing interdisciplinary scholars seeking information (Spanner 2001).

Fenton's study (2010) found that archivists mostly did see thesauri and controlled vocabularies as important in indexing and for later information retrieval. But there was no consensus on which thesaurus to use, and sometimes many thesauri would have to be consulted when searching.

On a very practical level, a study of art museums in the USA found that controlled vocabularies are time consuming and require expertise to implement. This is an added expense in staff time and training especially for those museums that do not have a dedicated cataloguing staff (Gilchrest 2001 p. 7). Others describe how institutions underestimate time and labour needed to implement and maintain controlled vocabularies (Coburn & Baca, 2004).

Positive views

On the positive side, controlled vocabularies increase search precision because searchers can use unambiguous standardised terms and because controlled vocabularies link related terms. (Lanzi 1998, as quoted by Gilchrest 2001). A study by Taylor and Gross (2005) showed that using controlled vocabularies when indexing increased search effectiveness, even if searching was only by keyword. A university library experience found that keywords and controlled terms complemented each other when searching (McCutcheon, 2009). In the museum world, studies maintain that relating terms and finding consistent ways to describe resources assists information seeking and so enhances access (Amin, van Ossenbruggen, Hardman, & van Nispen, 2008; Chaudhry & Juin, 2005). Combining vocabulary tools from museums, libraries and archives reportedly provides better end-user access according to at least one museum's experience (Baca & O'Keefe, 2009).

User preferences

Environmental and personal factors influence whether people will use controlled terms to search a database. Fidel (1992) found that this decision was influenced by several factors. These included the nature of available terms, the nature of the search request, personal preference, the availability of a thesaurus, the number of databases to be searched and the quality of indexing. Job tasks and context were likewise important factors in whether people used controlled vocabularies according to Mai (Mai, 2011; Mai., 2008). Gilchrest specifically noted in her study of art museums that the presence of individuals with information and library science background was a factor in improving adoption of controlled vocabularies (Gilchrest, 2001).

Recent studies have found that natural language searching was the preferred search method for users of a library system, as searching with controlled vocabularies was often ineffectual and frustrating when subject headings were unfamiliar (Guo & Huang, 2011; Waller, 2010).

Studies of children's information seeking behaviour have found that children prefer to browse from a list of terms rather than to enter keywords of their own choosing into a system. (Borgman et al and Hirsh as cited by Abbas 2005 p. 513). This suggests that inexperienced users prefer to choose from lists of pre-selected terms (as in a thesaurus). However Abbas found that representational tools such as controlled vocabularies must be designed with users in mind (p. 1520). Her findings and those of Guo and Huang, and Waller suggest that anyone using a system needs access to vocabulary that is appropriate to their experience and searching methods.

Studies of controlled vocabularies in archives and museums

There seem to be few studies on usage of controlled vocabularies in museums. Those that exist concentrate mostly upon inputting data.

Baca and O'Keefe (2009) shared an experience of creating consistent metadata rules for the Morgan library/museum in the USA. They found that people from different communities had differing ways of expressing and describing materials. Despite this, curators and librarians did not have great issues with using authority lists and controlled vocabularies from a range of sources, including Getty and the Library of Congress (Baca and O'Keefe p. 66). This agrees with Waibel and Erway

who observed that the lines are blurring between library, archive and museum uses of published terminologies (Waibel & Erway, 2009, p. 11). However it disagrees with Doerr's observation that people are reluctant to use controlled subject terms.

Fenton (2010) looked at the use of controlled vocabularies and thesauri in archival online finding aids in the UK. This study found that archivists mostly did see thesauri and controlled vocabularies as important in indexing and for later information retrieval. But there was no consensus on which thesaurus to use, and sometimes many thesauri would have to be consulted when searching. (p. 199)

One study was found specifically to do with controlled vocabulary use in museums. Gilchrest (2001) focussed on art museums in the USA. This study of 30 museums found 60% used at least one controlled vocabulary reference, and 90% used customised lists of authority terms, when entering data. 30% of those who controlled terms used them to search. People in the study commented frequently that the quality of the information in the databases affected the quality of search results. Interestingly, Gilchrest noted that the presence on staff of people with information and library science education was a factor in improving adoption of controlled vocabularies. She also noted that the desire to share collections information (e.g. on a website) meant people were more likely to want good terminology control. Gilchrest's study identified "institutional traditions and long-standing habits" as significant barriers to controlled terminology use. Practically, barriers manifested as: availability of resources (staff time, training, financial and administrative support); vocabularies themselves (too complex, not enough scope, inaccurate); and time required to implement terms.

In New Zealand, Delaney (Delaney, 2009) looked at how archives in New Zealand use standards. One question asked about data value standards (this covered controlled vocabularies). Delaney found that 50% of respondents used some form of authority standard. These varied widely, and included sources from the LCSH to Heinemann's NZ Atlas. Other sources were thesauri included in or linked to the CMSs used by archives. She hypothesised that electronic CMS are influencing archival description through this observation.

Kingston (2011) stated that the Museum of New Zealand Te Papa Tongarewa has since 2005 used controlled vocabularies in 70% of its CMS fields, in order to improve consistency in description. Te Papa uses the Getty Art and Architecture Thesaurus, the Getty Thesaurus of Place Names, the Library of Congress Thesaurus for Graphic materials, the Linnaean taxonomic system, and other thesauri. This reportedly brings benefits such as comprehensive descriptions which can be understood worldwide, and allows browsing through hierarchical relationships. But it has taken a lot of work and training for staff to learn to implement these controlled vocabularies well, and integrate them into the CMS. Te Papa has also worked with the Getty Foundation to add Maori and Pacific terms and concepts to their thesauri (Kingston, Todd, & Roberts, 2011).

Summary

The above review illustrates that controlled vocabularies are used more with the adoption of electronic databases and heightened desires to share and access collections data. There are many published vocabularies for different materials, and

these are increasingly shared across communities of practice (libraries, archives, museums). Difficulties with using controlled vocabularies are to do with lack of trust, lack of familiarity, and with having enough resources to implement, use and upkeep them.

How people search using controlled vocabularies in museums is not well covered in the literature. How museums in New Zealand are using controlled vocabularies to search their electronic collections databases is also not really revealed in the literature covered.

Rationale for study

A study of controlled vocabulary use in searching by museum collections staff searching for museum collection information in their own CMS/database would go some way to revealing the significance of controlled vocabularies to accessing museum collections. This study may shed light upon the extent to which people are aware of controlled vocabularies, how people understand and use controlled vocabularies, and how well people trust controlled vocabularies to deliver consistent and quality results when searching.

Research questions

These questions will attempt to add to knowledge about the use of controlled vocabularies for searching in New Zealand museums.

These questions are based on several assumptions:

- That museum collection staff search for a variety of materials and not only in their specialist subject area.
- Controlled vocabularies are tools that aid access to data in the database in order for collections staff to do their work.
- Different institutions have different training and resources.

Questions

1. What is the significance of controlled vocabularies to museum professionals searching their museum database?

- a. What controlled terms are available to search museum databases?
- b. How and when do people use controlled terms when searching?
- c. What affects their use?

2. How do museum professionals perceive controlled vocabularies?

- a. Are they appropriate to the objects/materials they describe?
- b. Are controlled terms useful for finding things in a museum database?
- c. What barriers do people see to using controlled vocabularies?

Research frameworks

This study used ideas from Cognitive Work Analysis (CWA). CWA is a holistic way to look at information behaviour. It attempts to place people rather than the technology at the centre of analysis in order to create systems that support people's work (Vicente, 1999, pp. 12–13). CWA assumes that people undertake tasks within a broader context or environment, which affects how they make decisions and carry out tasks. In an information seeking study following her work on controlled vocabularies, Fidel used this framework to analyse information seeking behaviour in a work environment. Fidel identified the task, the actors' resources and values and the environment as playing a role in peoples' actions and decision when seeking information (Fidel, 2004). Mai (2008) suggests that CWA is a good framework to use when designing controlled vocabularies, because they then are suited to the context in which they are used. See the following depiction of the CWA model.

Applying the CWA framework in this study allowed a small sample to reveal how contextual variations (in subject matter, job tasks, search experience and so on) were significant to controlled term use and perceptions among museum collections staff.

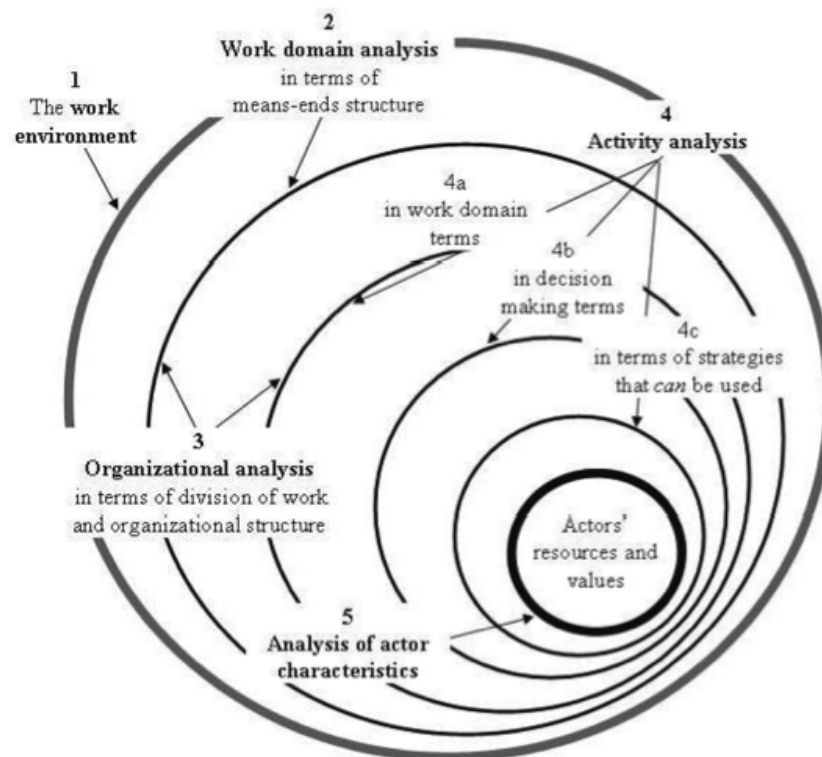


Fig 2: Dimensions of Cognitive Work Analysis (from Mai, 2008)

In this study – the museum CMS or database and the person’s job tasks comprised the work domain: these dictated what the aims were when searching, and what controlled terms were available within the database for people to use. Additionally, CWA looks at the resources and values of individual people. In this study the task was searching the database in response to various needs: a CWA model explored how people’s decision whether or not to use controlled terms was affected by term availability, the task in hand, as well as factors such as their own knowledge of terms and their experience with controlled terms as effective search tools. Using this model, this study explored whether and how environmental and contextual constraints influenced actors’ actions.

Bowker and Star’s (1999) themes for analysing classifications also guided the ideas in this study. People classify things, and controlled vocabularies are a way of doing this. Classifications may be very tight (Linnaean) or loose (Roget’s thesaurus). They change over time – for example to encompass new technologies or activities. Deciding what standards to use has repercussions in that materials may not fit well into a standards system. Controlled vocabularies may help find some things, but other things may fall through the gaps by being less well described and so less visible in the system. In this respect, controlled vocabularies may not be as useful for picking up the “long tail” – all those objects/materials that are only slightly related to the search terms, yet which may contain relevant information.

Research methods

Sample

In this study, the researcher interviewed eight people from four museum organisations around Auckland. These museums were chosen for proximity and because they all used electronic databases to track their holdings. The original intention was to represent small, medium and large museums in the study. However, preliminary research⁵ indicated that the search end of controlled vocabularies was less relevant to smaller organisations with fewer holdings, in the early stages of transferring hard-copy records to a database, or not yet using a digital database (New Zealand Tourism Research Institute, 2009; Robinson, 2011). The issues for these small organisations could be the focus of a future study.

From each organisation, a person from the library area and from the collections/exhibitions area was interviewed. Convenience sampling dictated the group mix to some degree, but there was a conscious effort to ensure that there was some balance in work areas in order to gain perspectives from people from different areas within organisations. The aim was to capture the views of people from various institutional backgrounds and in a range of collections-related roles in order to gain a range of insights into controlled vocabulary use for searching.

While a comparison between library/non-library staff was not originally intended, the sample make-up and research framework invited analysis of the impact of job tasks. Thus research analysis (following) discusses:

- Differences in search strategies for people within organisations;
- Whether library staff and collections staff have different search methods and use controlled vocabularies differently.

Data collection

Investigation took the form of semi-structured interviews. People interviewed had to be those who regularly (over three times a week) searched for material in their museum's electronic database. They could be full or part time staff in the museum. Selection for interviewing was first by convenience sampling, followed by snowball sampling. Thus the researcher began asking people she knew, and was fortunate to gain introductions to other respondents this way.

Interview questions aimed to investigate what people think and feel about controlled vocabularies as search tools.

⁵ I spoke to a person who had helped a small volunteer-run museum set up its digital database. I also noticed the holdings of some museums were small, and probably did not need a complex system to track. See also New Zealand Tourism Research Institute (2009) - respondents in this survey commented that they first faced challenges recording inventories electronically.

The first set of questions aimed to answer research question 1. These asked about people's job title and work area, followed by ascertaining a description of their job tasks that require searching the database. For example, whether they mainly search in response to a research enquiry, in order to make an exhibition or display and so on. This was to get a background context of what people do, and to get an idea of search tasks and subject areas. Next, people were asked which (if any) controlled vocabularies they use when searching, how they know about these vocabularies, and when (in response to the tasks described above) they use them.

The second set of questions aimed to answer research question 2. These questions explored people's perceptions of controlled terms and controlled vocabularies. People were asked if they thought controlled terms adequately describe materials in their museum's collection. Next they were asked if they thought controlled terms are helpful in accessing materials. Finally, they were asked about what barriers they see to using controlled vocabularies.

Interview duration ranged from 25-45mins. To ensure accuracy, after completion of the interview, the interviewer reflected back to the respondent the main points of the interview, to check that answers to questions were correctly understood. Further, each respondent was emailed a summary of their answers approximately one week following the interview, so they could re-check that their ideas were represented properly. Some of the people interviewed opted to be sent a copy of the overall research findings.

Limitations of study

This is a snapshot only of people's views. The small sample means it is not necessarily representative of museum collection staff as a whole. However all respondents were encouraging and interested in the topic indicating it is worth studying.

The study excludes some groups within the museum community – notably small museums. As previously noted, small museums are less likely to have electronically catalogued their collections. It is worth seeing what support these organisations require for implementation of controlled terms, perhaps in a further study.

The study also did not interview any registrars – this job role appears to be important in collection terms – see discussion and comments on collegial support in analysis section. Once again, this group could be included in future research.

Lastly, the researcher's own bias and skills influenced the study. This was evident in words used to couch questions – these were adapted when their meaning was not clear to respondents. It was also evident in interview style – in early interviews the researcher interjected too much. The interviews could have been allowed a slightly longer time, or had fewer questions. This would have allowed respondents to expand more upon their ideas.

Data analysis

Why search?

Respondents' reasons for searching their museum database were grouped as follows:

1. Research enquiries: for other people – members of the public or other staff. This could be on topics - familiar or unfamiliar, or could be related to specific objects in a collection. Often there would be time-restraints, for example with telephone enquiries people would like to give an immediate answer, however they did not want to compromise accuracy.
2. Research: for exhibition development or support e.g. making labels for exhibits, redeveloping galleries, planning an exhibition. This could be for other people if the person's role is as part of a larger team, or for oneself – if developing an idea for an exhibition. This would generally have fewer immediate time constraints and would require a broad and comprehensive search.
3. Cataloguing: necessary to search the database to ensure consistency when entering subject terms (see what has gone before), to prevent duplication, to link items and to link documents to items.

As mentioned in the “sample” section above, respondents were all Collections staff. Specific work areas were self-described as (variously) library, archival, exhibitions, collections and curator. Job tasks influenced reasons (and strategies) for searching.

What databases?

The main databases people talked about searching and from which they drew examples were the focus of interview discussions. These were museum CMS and library systems. On an organisation level, two organisations used one system for all museum materials including library/archive items and museum objects. One organisation used one system for archives and museum objects and another for library items. One organisation used a museum CMS for objects and another database for library and archives. This shows the diversity of even this small sample. Only two respondents mentioned that they used more than one database.

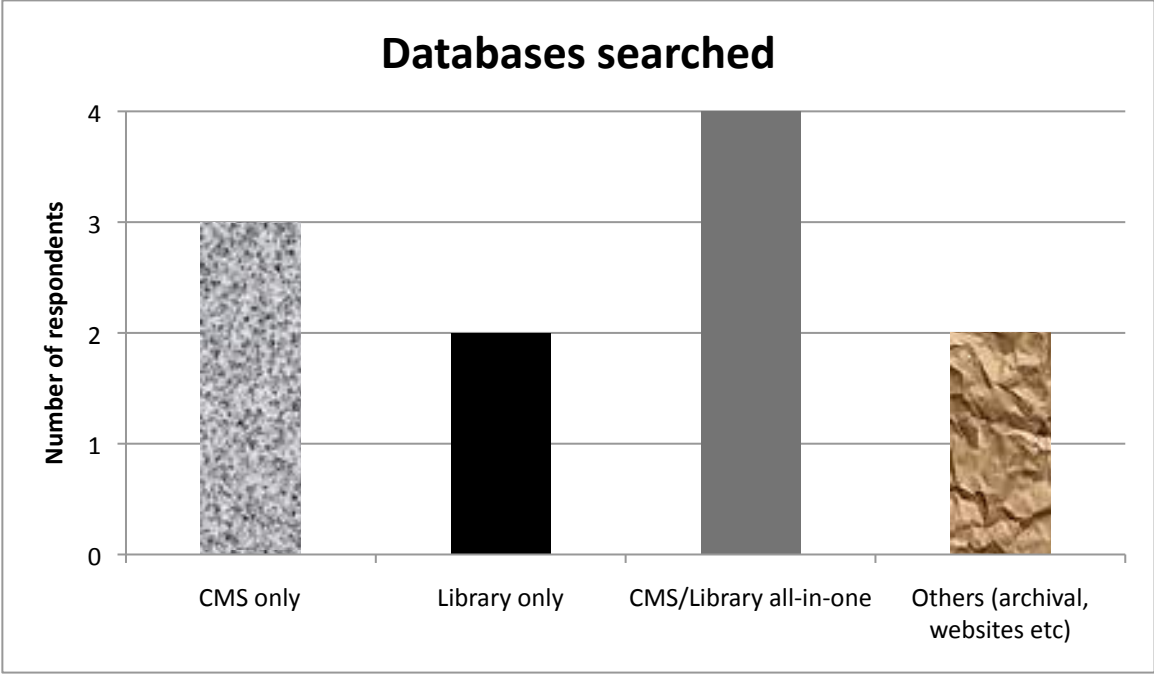


Fig 3: Databases searched

Experiences with searching with controlled vocabularies/authority terms seemed to be similar across all databases.

What controlled terms?

The sources shown in this illustration are just those named by respondents.



Fig 4: Controlled terms in the databases.

The answers illustrate people's knowledge of a) the database and b) controlled terms.

Two people (non-librarians) were initially not aware of any controlled terms in their organisations' database. However when prompted they mentioned departments, collections and locations, which were controlled terms in the database. All respondents (after prompting) named at least one internal controlled term list. Respondents who worked in the library areas all named specific (external) sources of terms. The effect of previous experience and training in use of controlled terms was displayed by these answers.

Controlled terms in database by theme

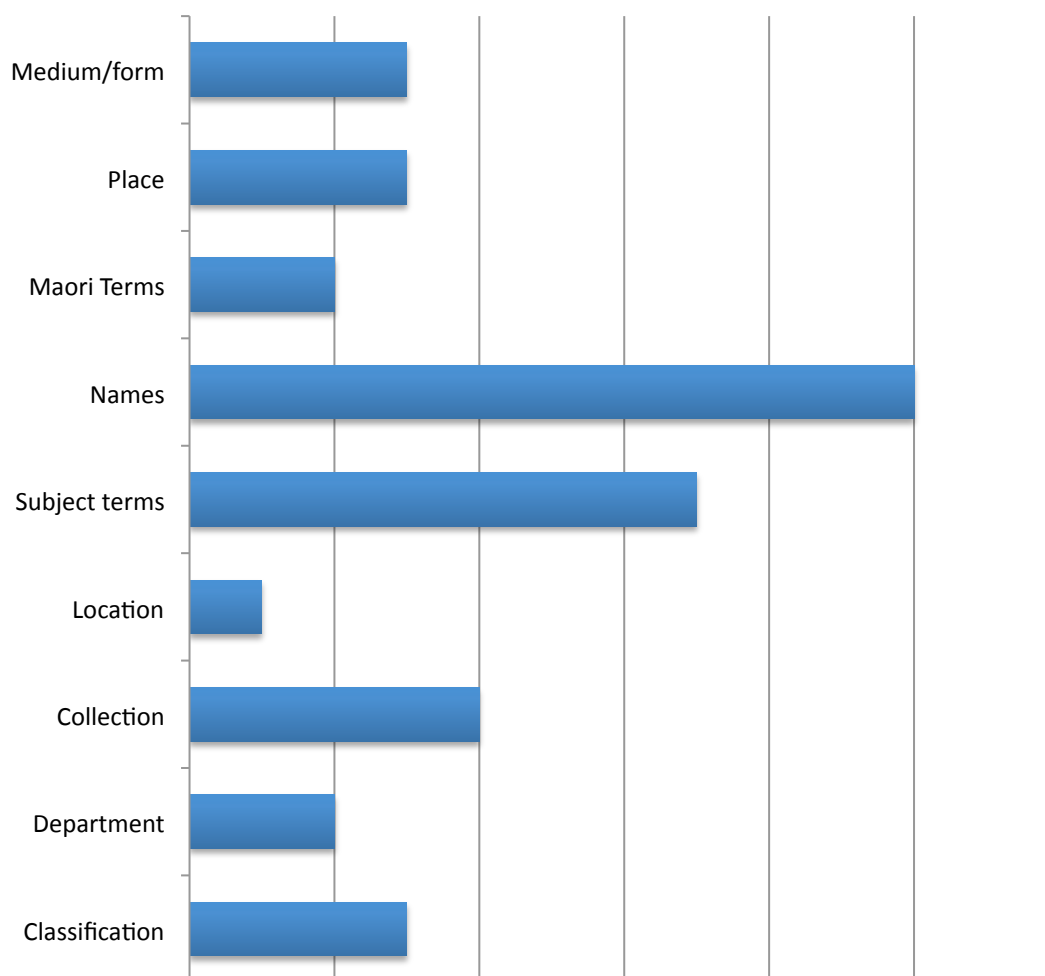


Fig. 5: Controlled terms in the database by theme

Grouping the various answers thematically shows the importance of names, followed by subject terms, classification and collection, to interview respondents. Names include those of people, events and organisations, and it is important that these are controlled due to the many different spellings or forms they can take.

Sources of controlled terms

Controlled terms were:

- External and installed into the database – available as drop-down lists in controlled fields. For example, Library of Congress Subject headings or Chenhall's Revised Nomenclature for Museum Cataloguing.
- Authority lists built into the database or built in-house and which were controlled fields in the database. These could be simple lists or more complex. They could be modified or added to by authorised staff. For example name files, (including organisation, business, author, role, publisher) places, department, location.
- External sources used as references, and added to free-text fields in the database (semi-controlled in terms of how they function in the database). For example specialised subject guides and dictionaries.
-

Sources - examples	How used	Used
<ul style="list-style-type: none"> - Getty Art and Architecture Thesaurus - Chenhall's Revised Nomenclature for Museum cataloguing - Library of Congress Subject Headings (LCSH) 	External control – built-in database lists	x3
<ul style="list-style-type: none"> - LCSH - Dictionary of NZ Biography - Oxford Dictionary of Maritime terminology - Maori Thesaurus (from National Library of NZ) - NZ Gazetteer of Official Geographic names - Union List of Artists names (Getty) 	External control – external references (Specialised subject dictionaries, not built in to database)	x2
<ul style="list-style-type: none"> - Department - Location - Names (Include organisation, business, author, role, publisher...) - Places - Collection 	Internal controlled terms – database lists built in-house (these may reference external sources, and term lists vary in complexity)	x8

Fig 6: Sources of controlled terms

Three respondents mentioned using external controlled vocabulary sources in their databases. External subject thesauri for museums (Getty Art and Architecture Thesaurus, Chenhall's Revised Nomenclature for Museum cataloguing) and subject headings for libraries (Library of Congress Subject headings) were installed as controlled fields into two organisations' databases. This use of controlled term lists from both library and museum sources is consistent with the experiences of Baca

and O’Keefe at the Morgan Museum, and to Waibel and Erway’s observations that lines between library, archive and museums are not strictly drawn.

Of the three people who mentioned Library of Congress Subject headings – two used these in controlled form, with modifications for New Zealand spelling and specialised subjects. Three people mentioned Maori terms.

Two people mentioned other external sources of controlled terms by name. One person mentioned citing these – i.e. that when they use external sources or dictionaries they reference the source on the object record. The other referred to them for subject terms to use when searching or cataloguing, but the terms were not referenced in the database.

Knowledge of controlled terms

All respondents knew about controlled terms from their experiences using the databases, and learning on the job. Three people mentioned colleagues as important for helping and advising them on search terms. Two consulted colleagues regularly when unsure about subject terms or how to use fields in the database for best searching advantage.

“Reference work and cataloguing feed into each other.” Five people stated that their past experience indexing or cataloguing objects in the past had helped with knowing how things were described, and what fields were useful for increasing speed and accuracy of searches. Library-trained people seemed more aware about what terms were available - they named specific sources of controlled terms, and described how they are used in the database. All these people had previous cataloguing experience. One person in the exhibitions area (who had also done cataloguing) was aware of many terms, but felt that you needed specialised subject knowledge to use subject-oriented terms well.

Factors influencing use of controlled terms when searching

1. The requirements of the search - did it need to be in-depth, or was it a question requiring a quick response?
2. The person searching – their job tasks, work area, subject knowledge, knowledge of the database, knowledge of terms, and their personal preferences.

For all respondents, authority terms and controlled vocabularies did not guarantee good results on their own, but respondents reported that a combination of these with key words (an all text search) did. Controlled terms were used to narrow and focus searches. Nearly everybody regularly used at least one controlled term and/ or controlled field when searching, but rarely used controlled terms alone. People tended to combine an all text search (and in one case a quick search) with a controlled term or terms. All text searching brought broad results, and controlled terms made the search faster by eliminating the need to examine many results for usefulness. This was particularly helpful for telephone enquiries or research enquiries needing quick answers. For research without such time constraints,

controlled vocabularies were still useful for getting relevant search results. These experiences align with the research from Taylor and Gross (2005) and McCutcheon (2009) that observes that a combination of all text and controlled terms is most effective for searching.

Controlled terms often mentioned for searching were: name (of person or place), format, and collection. These are classed in Fig. 6 as internal controlled terms – lists formed in-house in the database. Classification was mentioned by two respondents, however both found this trickier to use – as one said “you need to know the subject well to use this”: the other kept a list on the wall of terms or consulted colleagues (registrars) for advice on what terms to use.

Comments were:

“An all text search is useful for unusual or unique objects”

“I use lots of different keywords for unfamiliar things and try to narrow these results with controlled terms e.g. gallery location”;

“I tend to use name – of person - combined with keywords, and narrow the results by collection or format”

“I try for familiar things using authority controlled terms, but this is not always successful”.

Use of subject headings depended on peoples’ confidence with the subject matter and knowledge of subject terms. People did not use them unless they knew what to enter. One person used subject headings from previous successful hits on a topic to find more material. Another said they used subject terms if looking for items on a particular subject, such as “Christmas cards”. Another used a semi-controlled system: “I use an all text search – but I use subject words from dictionaries”. One person, who made lists of materials under personal terms, referred back to these when searching for topic material. These answers align with the studies by Abbas (2005), Waller (2010) and Guo and Huang (2011) that found controlled vocabularies need to be accessible to searchers and appropriate to their experience and search methods.

Terms had to be up-to date and relevant. In one organisation, a classification list formed in-house was rarely used, as it was a legacy system that did not fit with current thinking. One person (exhibitions area, no cataloguing experience) mentioned making personal lists (using a database “list” function) of things under subject headings of their own. This effectively tagged objects with their own subject keywords, and formed a list in the database which was meaningful to that person. (This, apart from the authority files that were formed in-house, was the closest any respondents came to forming an in-house subject term list.) One respondent would like to see all museum users, not just staff, able to tag items with their own words to make the description more meaningful.

Job tasks influenced searching. While all respondents at times searched in response to research enquiries from the public or other museum staff, two respondents’ stated that their jobs primarily required them to use the database to find materials for use in exhibitions and for disseminating information about the collections to the public. They wanted in-depth information on a topic and did not

have time or the knowledge to worry about search terms. Some respondents sometimes searched the database in order to catalogue materials: they checked for duplicates, terms already applied and links to other materials. They were attentive to terms used in the database and adapted searches accordingly.

The possibility of asking for help influenced the use of controlled terms. Respondents who did not ask for help from other staff seemed more frustrated with controlled terms as not working for them. While librarians seemed more confident with using controlled terms when searching (most likely due to their cataloguing experience and tasks), there were both librarians and non-librarians who reported asking colleagues for suggestions for search terms. These respondents seemed more satisfied with their search results, overall.

In total six respondents mentioned the registrar as a significant collections staff member. While a description of the registrar role is beyond the scope of this study, it was obvious that respondents saw the registrar as important for accessing collections. Respondents said registrars ensured accurate and consistent data was entered in to the database, and were people who could support them in database search terms and strategies. One organisation had no registrar – respondents from here felt that this had adversely affected quality of data in the database. A respondent from another organisation had noticed a new registrar's work as improving data quality in their database. These comments highlight the importance of having people on staff who are experts in using the database and who can provide guidelines and policies for using controlled terms. No registrars were interviewed in this study – it could be useful to ask registrars about controlled terms for searching in a future study.

Collections staff perceptions of controlled vocabularies

How well do they describe the collection?

One respondent thought that controlled terms did a reasonable job of describing the collection when entered by a skilled person. All other respondents felt more ambiguous.

“Some do and some don't”.

“They are fairly good but can be frustrating because you are looking for something and you know it is there, but you don't necessarily get it”.

“It depends what is going into the database”.

Four respondents said that controlled terms are not nuanced or specific enough to describe materials held by their organisation, especially for specialised topics. This includes both subject terms from external sources (built-in or referenced) and internally created authority lists such as that for medium/materials. One respondent said they are not flexible over time for changing ways to describe situations such as the names of people's roles. Also every subject is diverse: “you would have to write a book on each subject to have enough terms to cover it”. Some respondents said terms are not consistent – “things can be called three different things”; “one subject can fall under several headings”. They are also not always obvious: “you have to

think laterally – sometimes terms don't exist and sometimes I don't use those terms often enough to be confident with them".

Quality of information going in to the database was a factor which respondents thought affected adequacy of terms. Four people thought the quality of data entry was often poor. This negatively affected consistency of terms, accuracy of information and fullness of records. Two people pointed out that good cataloguing is time consuming – without effort to make good records the quality of indexing/cataloguing will be poor.

These answers point to three issues with controlled terms, all of which previous studies have noted.

1. Firstly, the vocabularies or term lists themselves may not contain language or words to successfully and fully describe every object over time.
2. Secondly, if terms are inconsistent or not obvious (not known to searchers) this makes them less satisfactory.
3. Thirdly, information entered into the database affects adequacy of controlled terms.

These points were repeated when people spoke about their difficulties when using controlled terms to search.

What are the problems with using controlled terms when searching?

The answers people gave to do with difficulties in using controlled vocabularies and controlled terms to search were similar to how well they thought they described the collection.

The main problems were:

- Terminology consistency and specificity
- Quality and accuracy of records
- Experience in searching the database and in using terms

There were many comments about the quality of data entered into records affecting the efficacy of controlled terms for searches. Poor quality of records was put down to time and experience. Records entered hastily would lack subject headings or words and lack useful descriptive fields. General lack of experience and training of people doing past cataloguing meant that there was lack of consistency (for example with subject headings), or descriptions were too general to be useful, or that useful fields (such as location, provenance) were not filled. Thus records could contain only very basic information. One respondent found records often contained inaccurate information, due to errors in data entry. Duplicate records were also mentioned as difficulties (more than one entry of the same item in the database). An experienced cataloguer will search for duplicates before entry, and allocate consistent terms. A respondent noted "you have to be a special sort of person - anal in a way - or you might cut corners in subject indexing". Another problem mentioned was the cataloguers "take" on the material (meaning they may miss aspects of the material which are important to searchers). This is an issue which as

one respondent said, demonstrates that “cataloguing is an art (rather than a science) – in that there is no right or wrong exactly”.

Terminology was a problem mentioned by everybody. Firstly, terminology was not specific enough to describe collections from usual authoritative sources such as Library of Congress or Chenhall. “There is no one specific thesaurus for the terminology we use”, stated one respondent. One respondent noted that end users are extremely important, and that in the museum context, items may be catalogued using different terminology from (say) a general library context. This requires additional descriptions and knowledge of user requirements when cataloguing and searching. Two respondents mentioned American spellings and terminologies as a difficulty, which they overcome by altering spelling to suit New Zealand spellings, but also noted that experience helped in knowing which terms to use when searching. One person noted that the different words could describe the same thing: “Who makes bags? A seamstress or a tailor?” Another noted that there was no policy in their organisation for labelling so in the past different people had labelled things similar things differently, causing confusion when searching in the present.

Several people (from both library and non-library areas) said they felt they could be searching the databases more effectively. Experience in searching was mentioned by six people. People from the library area valued their past experience in reference work as helping them to search, but noted that training in using a specific system was important as well. Four people (from both library and collections areas) said that learning to manipulate the specific system (database) was very important to get best results. Two respondents asked colleagues for help with search strategies. Three people had received specific database training and one in particular said it had made a huge difference: although she was already experienced in reference work, she had learned better how to manipulate the database for searching. Indeed, six people thought training would be useful, if they had the time.

One respondent summed up difficulties in using controlled vocabularies for searching as database or terminology based:

“It is sometimes a term, and sometimes a method”.

Are they helpful?

Despite that not everybody thought that controlled terms were specific, adequate, accurate or obvious enough, everybody thought that they helped to find things.

Comments included:

“A conglomeration of information would result without them”

“It would save an immense amount of time if you knew things were always described in a certain way”

“As long as they are entered and entered consistently they help focus searches”

“They prevent misspelling of names”

“Subject headings can link you to allied material”

Controlled terms roles in accessing collections

All respondents thought that controlled terms would help with sharing collections to users outside the museum. One person saw controlled vocabularies as important for compatibility with outside databases, although commented that making controlled vocabularies for specialised terms would be tricky. Another person said that committing to more professional records and data standards will ease sharing, particularly using subject terms for when the title does not reflect the content.

One organisation is already sharing their collection, using subject headings and additional keywords, name, and title as access points to an online collection.

Controlled vocabularies were seen as important for finding items and their contexts: “consistency in names is important for linking artefacts, for example ‘Nouvelle Hebrides’ would not be found by a person searching in English.”

One respondent would like to see people able to tag items with their own words: “we need to ask the community about the words that are important to them when describing an object, as this gives context to the object and makes the description meaningful.”

Two respondents thought controlled vocabularies would make systems reliable. Controlled terms would help people to find things, “but you would have to give people the information on what terms to use. It would be nice to have something like the Powerhouse Museum Thesaurus Online for the New Zealand museum community to use.”

Discussion

Controlled terms aim to improve access to database materials. In museums, this means accessing collections – or at least information about collection materials, in order that these materials may be used for research or display. All the respondents in this study thought that controlled terms could assist with accessing collections, in theory. In practice, some respondents found them difficult and frustrating to use.

Specificity + Accuracy + Consistency = Trust

In the literature, the major negative observation about controlled terms is that plural viewpoints are missed (Bowker and Star, 1999; Shirky, 2005; Mai, 2011). This was picked up by respondents and described as a lack of specificity in terms. This most particularly refers to subject vocabularies. Many of the established vocabularies use American spellings and most subject vocabularies lack terms with enough nuance for specified subject material. Respondents also thought that terminology in was often not intuitive, that it was not how they would have described materials. This made it difficult to select some controlled terms. One respondent suggested that allowing communities (i.e. the general public) to add subject tags to materials would give up-to-date and relevant terms about materials. Another made lists of materials labelled by keywords relevant to her, for easier access later.

Several respondents mentioned the importance of cataloguing for data quality and accuracy. This affects whether databases contain accurate and consistent information - both in database fields completed to describe materials and in data in individual fields within records. Gilchrest noted that controlled terms are time consuming to implement, and many museums do not have dedicated cataloguing staff (2001). In this study, this was the case in one organisation that had no registrar and a very small and task-stretched collections staff. Indeed, several respondents mentioned the registrar as the person who ensured quality and consistency of database records. Other respondents mentioned cataloguers' lack of experience as adversely affecting the quality of their database records.

In theory, if controlled terms can be extended to describe materials specifically enough, and if terms are accurately and consistently entered into the database, people will trust the terms well enough to use them in searches. This would require staff time, training and financial and administrative support: that is, recognition that controlled terms are important enough to properly support their use. "Vocabularies have to be available and museums have to know about them and know they are important." (Baca, as cited by Gilchrest, 2001) Good news for New Zealand museums is that the Museum of New Zealand Te Papa Tongarewa is leading the way by example in controlled vocabulary use (Kingston, 2011) but knowledge and resources must be disseminated to smaller organisations for controlled vocabulary uptake across the board.

Experience + Training + Peer support = Knowledge

Experience with terms and experience with the database affected how people used controlled terms. People avoided subject lists when they did not understand them because in these cases searching by subject wasted time and led to poor results. Respondents did more regularly use authority controlled terms they understood such

as department and collection. There were people who did not ever search with controlled terms as first choice and who did not find them very reliable. Some respondents used them regularly but always in combination with other methods as results could be mixed, and some used them confidently and chose to use them first in some search situations. One respondent would like to see a thesaurus like the Powerhouse Museum Object Name Thesaurus available for New Zealand museums so that subject terms could be chosen from a list. (This is in fact now available as a downloadable pdf document, but does not contain specifically New Zealand terms at time of writing.) The option to choose terms from a list is a good when one is less familiar or experienced with available terms (Abbas, 2005).

As well as experience with terms, experience with the database affected how people searched. If people knew what information populated database fields within a record they could search that field confidently. Most people got database experience on the job – familiarity with the database was greatly improved by cataloguing tasks and formal database training (see below).

In this study, there were differences in ways of talking about controlled vocabularies for respondents from library and non-library areas. Knowledge of controlled terms available within databases varied. Library staff named more and used more controlled terms. However collections staff also used many controlled terms. While all respondents sometimes used some form of controlled terms (names/formats/locations were often mentioned), library-trained staff were more likely to name and use subject terms, particularly classifications such as Getty, Chenhall and Library of Congress Subject headings. Two collections staff were aware of subject and classification terms, and used them when searching; one would have liked to but did not; and one preferred not to due to previous bad experiences with subject headings. This aligns with Gilchrest's study (2011), which found that library, and information science trained people on staff assisted with the implementation of controlled vocabularies.

Training in both controlled terms use and database use affected how people used controlled terms. Cataloguing was mentioned by some respondents as assisting them to select controlled terms when searching for materials. On the other hand several respondents said that their experiences searching the database had made them better cataloguers. Formal training with the database had greatly helped one respondent. The issues are time, resource and job task related. It is often difficult to find time and money for training and it is not realistic to expect all collections staff to learn cataloguing in order to know controlled terms well. Therefore two things are important. Firstly, (as observed by Abbas, 2005, Waller, 2010 and Guo and Huang, 2011) that terms are suitable for the context and reasonably easy to use; and secondly, that collections staff are supported to use controlled terms by an experienced colleague.

Peer support and training were factors which influenced peoples' use of controlled terms – both when selecting authority terms in the database (manipulating the database), and when using subject terms. Some respondents mentioned calling upon more experienced colleagues for assistance when searching. Others mentioned the need for consistent policy with regards to implementing and up keeping controlled terms to ensure consistency, relevancy and accuracy. This would probably require a dedicated person on staff to be responsible for this, and, as noted

by Gilchrest (2001) would require organisational administrative and financial support. This aligns with the ideas of Fidel (1992, 2004) and Mai (2008) who stated that wider organisational context will affect people's actions and choices in work situations. If people do not have the resources and back-up support to use controlled vocabularies, they are less likely to use them. As noted above, the registrar was mentioned frequently, as a key role for this kind of support. Library-trained people are another support possibility for people needing database or controlled terms assistance. Despite the knowledge shown by respondents from the library area with controlled terms, no one in this study recognised library and information science trained staff as experts in controlled terms use. The indications are that there could be scope for library and information management trained staff to share knowledge with other collections staff in some search situations.

Conclusion

Talking to this sample of collections staff from medium and large museums revealed a range of uses, knowledge and thoughts about controlled vocabularies for searching. Controlled terms are not without their difficulties, and when applied to complex situations they may not deliver completely satisfactory results. Controlled terms were rarely used in isolation for searching. Rather a combination of keywords and controlled terms seemed to be the most usual approach, even when searching for familiar items or within familiar subject areas. This was quicker, and brought more relevant results to searchers.

Collections staff have varied backgrounds that mean they have different levels of knowledge and expertise in using controlled terms and in database searching. Library and information science trained staff in this study had markedly more knowledge about controlled terms. All respondents found that more database experience enabled them to use controlled terms more. Respondents' strategies for getting better search results involved asking colleagues, making their own lists of terms, and trying different combinations of terms. Additionally, collections staff have varied job tasks and search focuses are different depending upon these tasks. As it is not realistic to expect all collections staff to be controlled terms experts, the importance of having specialists on staff who can advise others in their use is important. The registrar is one such person, but library-trained staff are also possible human resources.

If museums wish to enable access to their collections, it is important that organisations recognise the importance of allocating financial resources and staff time to cataloguing collections, and recognise the importance of training and support for staff searching the museum database in the course of their work. Consistent policies around controlled terms, formal training, support staff with database and controlled terms experience, and access to terms lists are factors that would assist controlled vocabularies to work better for the people who use them and those who would like to use them. In the wider New Zealand museum community, communication and knowledge sharing by larger institutions could also assist smaller institutions to overcome knowledge barriers to controlled vocabulary use.

People in this study recognised that diverse subject material and different ways of looking at things could influence how controlled terms were used. But despite this view that they were not perfect for describing collections, everybody thought that controlled terms were important tools for accessing collections.

“Without them, things could be lost forever!”

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Appendices

Appendix 1: Interview questions outline

Interview questions outline

How do people use controlled vocabularies when searching museum collections; and what are people's attitudes towards controlled vocabularies as retrieval and access tools?

Job tasks and controlled vocabulary use:

- 1. What is your work area (collections, library, archives etc)?**
- 2. What is your museum collection management system (CMS) or database and what tasks in your job prompt you to search this?**
- 3. What kinds of controlled terms are used in your CMS or database records?**
- 4. How do you know about these terms (e.g. from your past education/experiences; from colleagues/training in your present job)?**
- 5. When you search your CMS/database what of these controlled language terms do you use? When would you use them?**

Thinking specifically about controlled vocabularies – including formal or built-in controlled vocabularies, in-house thesaurus lists, subject terms, taxonomic terms, and authority terms.

- 6. Do you think controlled vocabularies adequately describe materials in your museum collection? Why/why not?**
- 7. Do you think that controlled vocabularies help you find information and materials?**
- 8. What are the difficulties that you encounter with using controlled vocabularies to search?**
- 9. Do you think controlled vocabularies could help your museum share its collections with others now or in the future?**

Appendix 2: Interview Cover Letter

Interview – cover letter

Dear....

I am undertaking a project about what language terms people use when searching their museum collection management system. This is for the research component (research paper) of the Masters of Information Systems I am studying at Victoria University of Wellington.

I am looking for people from the collections-related area who search their museum CMS 4 times weekly or more. If this is you, and you have time during November/December, I would like to ask you to take part in my research project. Your taking part would involve me talking to you, in an interview of approximately 30 minutes. I would ask you some questions about your work tasks and about language terms, in particular controlled vocabularies that you use when searching your CMS.

If you are unable to take part, I would really appreciate it if you could recommend to me any other people I could interview for this project.

Your answers would remain anonymous. After summarizing your answers, I will re-check with you that I have got your meaning correct, and you may receive a summary of my overall findings if you would like it. I will be submitting my research to The School of Information Management, Victoria University of Wellington.

Thank you for your time.

Yours sincerely,

Emma Chapman

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