

Yuqiao Cao. Collecting the Art of Vocabulary: Investigating the Use of Attributes in Museums' Collection Management Systems. A Master's Paper Proposal for the M.S. in L.S degree. April, 2020. 50 pages. Advisor: Christopher A. Lee

The museum community has limited guidance for collection management plans, and each art museum has to decide on its' own practice to best accommodate unique collections. The goal of this study is to explore the use of vocabulary for collection descriptions in museums' digital collection management systems. This study is based on an in-depth questionnaire with collection management staff at museums across North America. The results investigate the use of authorities or local thesauri as attributes and plans to manage and update attribute lists. This study aims to promote communications among the museums community, ensure institutions are on the same page in using and managing attributes, and provide suggestions for attributes as an important collection descriptor to enhance museum collections' discoverability and accessibility.

Headings:

Collection management (museums)

Controlled vocabularies (subject headings)

Subject headings

Museums

Metadata

COLLECTING THE ART OF VOCABULARY:  
INVESTIGATING THE USE OF ATTRIBUTES IN MUSEUMS' COLLECTION  
MANAGEMENT SYSTEMS

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A Master's paper proposal submitted to the faculty  
of the School of Information and Library Science  
of the University of North Carolina at Chapel Hill  
in partial fulfillment of the requirements  
for the degree of Master of Science in  
Library Science.

Chapel Hill, North Carolina

April 2020

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## Introduction

Museums, the denoted places dedicated to muses, hold a diversity of objects, their meanings, and their relations. The wide range of collections sets the central missions of museums: making, conveying, and preserving meanings of museum collections (Bearman, 2007). Museums collect natural objects and human-made artifacts and take them away from original contexts to form collections. Museums' knowledge representations support their missions. Museums make and record meanings, convey the understanding of meanings to a wide range of audiences, and preserve holdings and knowledge across times, institutional cultures, and systems. Information management, or how museums describe and record information, serves as a central purpose of all museums.

Within museums' central function of collection information management, description, as a part of cataloging, is crucial for recording, organizing, and searching information. Specifically, "attributes," as an element of description, support description and cataloging functions from multiple worldviews. Attributes in the museum community are the equivalent of subject headings in the library and archive communities. Unlike books in libraries where cataloguers can find information about the concise subject headings to record, museum collections are different. As David Bearman suggests, "the most important difference between libraries and museums was so obvious that it was typically overlooked. Museum artifacts and specimens lacked 'title pages' from

which descriptive catalogers could 'transcribe' the computer record (2007).” That is, on top of the wide range of objects a museum collects, often there is no way to obtain "objective" and unified information about an artwork or other museum objects.

Moreover, museums are less likely than libraries or archive to use authorized vocabulary tools. Commercial museum vocabulary tools such as the Getty's *Art and Architecture Thesaurus* and ICONCLASS are available. However, museum collections vary widely in scope, content, and purpose, and none of these controlled vocabulary schemas sufficiently address the variety of data required for describing them (Gilchrest, 2003). Also, despite the wide range of available controlled vocabularies for museums, many museums use folksonomies or a combination of controlled vocabularies and folksonomy to achieve flexibility and openness for their wide ranges of collections.

The application of attributes as descriptors is relatively new to the museum community. At the beginning of the century, museums all over the country, from the most prominent collections to smaller museums and local historical societies, made a leap from index card-based or shelf-stored systems to collecting information via digital collection management database. This shift allowed museums to reconsider the accuracy, thoroughness, and other potential uses of their data.

Compared to library and archives professional, communications among museum professionals on the use and management of metadata, especially attributes, appears to be more limited. Especially in free-admission art museums that associate with public universities and view education as a critical function, attributes management may be limited by the small staff numbers and lack of funding. This study recognizes the problems in managing attributes and the need for communications among the museum

community on attributes and the recognition of attributes as an essential metadata category. This study investigates the management and use of attribute lists in museums, concerns and solutions over attributes' functions in increasing collections' discoverability and accessibility, as well as communications among museums nationwide.

## Literature Review

Literature regarding the development and use of attributes as a part of museum collection description are sporadically, while studies on this issue were conducted from many aspects. The literature that this study is based on address issues such as the definition, use, and authority control of attributes in the museum community, past practices of using attributes to explore collections' comprehensiveness and discoverability in museums all over the world, gaps in museum metadata from the past decades, and the need of vocabulary standards and best practices regarding attributes in the museum field.

This study also recognizes Alison Gilchrest's 2003 paper "Factors Affecting Controlled Vocabulary Usage in Art Museum Information Systems" as the guiding study. Gilchrest's study provides a background of descriptive vocabulary in prominent museums in the United States at the beginning of the 21st century. Her study raises questions about descriptive metadata in museums and their digital collection databases.

### Attributes in the Museum Community

Until the 1980s, concepts like collection metadata and schemas, collection description, authority control, and controlled vocabularies received little attention in the museum literature. Giving museums' focus on individual unique objects, they have faced challenges in applying library and archives best practices for descriptive metadata (Baca, 2009; Elings & Waibel, 2007). Researchers identify problems when there is no control

over descriptive vocabularies. The first attempt to create a data structure specifically for museum information was the Categories for the Description of Works of Art (CDWA), which contains 512 categories and subcategories. However, Elings and Waibel (2007) argue that museums are in need of a smaller set of categories to better focus on individual collection. Studies also illustrate the necessity for authority control to eliminate the confusion caused by unmatching metadata schemas or vaguely defined vocabulary (Baca, 2009).

Issues due to lack of control over descriptive metadata, such as attributes, in the museum field led to the establishment of several commercial vocabulary tools. (Coburn and Baca, 2004). The Getty Research Institute introduced several metadata schemas, including the *Art and Architecture Thesaurus* (AAT), the *Thesaurus of Geographic Names* (TGN), and the *Union List of Artist Names* (ULAN), and the new vocabulary tool, the *Cultural Object Name Authority* (CONA). The Getty Research Institute and the user community have supported the development of the above vocabulary tools' over time (Harping, 2010; Harpin, 2013; Harping, 2019). The Getty vocabulary tools, along with other well-used schemas such as ICONCLASS, provide a foundation for the development of local authority field and thesauri in enhancing user access and producing means to promote integrated access to diverse museum information resources (Baca, 2003).

Besides the introduction of controlled vocabularies, the museum field also has built local vocabulary tools in digital collection databases and for online end-user search tools. One attempt is to create local attribute lists using folksonomy, or taxonomy specially designed for an individual institution's collection. In some institutions, curators, registrars, and staff from the collection management department decide on the local



attributes used to catalog collections. Other institutions provide opportunities for users and visitors to the museum's website to engage in "social tagging." Museums adopt social tagging systems, such as the Whitney for Kids or *steve.museum*, aim to bridge the description gap between the professional languages of museum curators and personal perspectives from the public (Dowling et al., 2013; Trant & Wyman, 2006).

## Past Studies: Practices in the Museums

Many studies focus on best practices in museums' use of vocabulary tools. The guiding research for my project, Alison Gilchest's 2003 paper "Factors Affecting Controlled Vocabulary Usage in Art Museum Information Systems," is the earliest study that I identified on how art museums create and manage attributes with their newly introduced digital collection management systems.

Apart from the Gilchest's study that summarizes and compares the use of vocabulary tools in multiple art museums and institutions, case studies from the past decade suggest that museums around the world are concerned about vocabulary application and usage. In a 2001 article, three staff engaged in art documentation at the Guggenheim Museum investigate metadata categories at Guggenheim, where art documentation is not a cooperative effort between the curatorial and registrar departments, but instead falls under the responsibility of the Archives, Library, and Museum Records department. The study discusses the benefits of applying library knowledge and practices of using vocabulary tools to better describe the museum collection information for Guggenheim's enterprise-wide missions (Seren et al., 2001).

Similar to large museums, medium-size local museums are also exploring challenges and opportunities for cataloging and access issues. A study on the art

collections at the William Randall Library at the University of North Carolina at Wilmington demonstrates librarians' solutions to improve collection access by using descriptive metadata and linking metadata from other separate databases (Benedetti et al., 2004). The boundary of librarians' and museum collection management staff's responsibility is further examined at the Albright-Knox Art Gallery at Buffalo, New York. The library and information science-based cataloging project demonstrate the importance of descriptive vocabulary for accessing and retrieving museum collections (Zoller & DeMarsh, 2013).

Cultural institutions outside the United States are also creating, managing, and exploring the best practices for descriptive vocabulary. A 2005 case study demonstrates the construction of a taxonomy for a Singapore-based cultural heritage network. This taxonomy offers a resource for cultural heritage institutions to evaluate existing attributes and standardize documentation practices in Singapore (Chaudry & Jiun, 2005). A collaborative effort of the Library and Documentation Center of Sao Paulo Museum of Art and the School of Communications and the Arts at the University of Sao Paulo led to the introduction of a controlled vocabulary scheme to support art documentation in Brazil. This joint team incorporated the linguistic, terminological, and documentary criteria of Brazilian culture and constructed controlled vocabulary to standardize and represent the specialized information in Sao Paulo cultural heritage institutions (Lima et al., 2016). Artefacts Canada Humanities also recognized the necessity of a more inclusive and compatible taxonomy for their collection database. The project resulted in a bilingual and expandable vocabulary structure for describing the Artefacts Canada database

records while simplifying the content grouping by constructing faceted vocabulary structures (Ménard et al., 2010).

## Recognizing Gaps and Needs: Controlled Vocabulary, Taxonomy, and User-Centered Folksonomy

Only when digital collection management systems and databases were first introduced, did museums start to encounter vocabulary tools. At that time, museum staff created terms without standardized procedures. Recent literature, however, suggests that “standardized terminology is a must” and “vocabulary control is very important to [museums]” (Gilchest, 2003). Little research has investigated museum staff’s thoughts, creation, use, and management of attribute terms.

Gilchest’s 2003 study views the use of vocabulary tools and attribute lists from the perspectives of curators and registrars. These museum professionals assign attributes based on the professional knowledge of art and unique objects and the purpose of collection management. However, the goals of cataloging and describing museum collections have shifted toward a new direction of making collection information more readily accessible for wider audiences and users. The Getty Research Institute has explored the adaptation of controlled vocabulary to better meet the needs of users who are not experts in the domains addressed by museum collections (Baca, 2003). Using controlled vocabulary schema in vocabulary-assisted search can “free catalogers and other data creators from having to enter the many variants or alternate names commonly attributed to objects and artists” (Coburn & Baca, 2004).

Other museums and information professionals agree that the best way to enhance collections’ accessibility and engage the museum community is to incorporate user-

centered indexing in descriptions. Social tagging tools such as *steve.museum* suggest that social tagging and its resulting folksonomy provide ways for museums to engage user communities and to understand what users of online collection databases value the most. Terms collected from social tagging serve as additions to attributes assigned by curators and trained cataloguers and can potentially reflect users' personal perspectives in public collections, hence creating stronger connections between cultural heritage institutions and their audience communities (Trant, 2007; Trant & Wyman, 2006).

Several studies investigate and compare the effectiveness of controlled vocabulary tools and user-generated terms as well as their functions as attributes and as keywords for searching in online collection databases. Results from multiple studies demonstrate that while controlled vocabulary has limitations and complexities in application, terms supplied by end-users have lower retrieval success (Matusiak, 2006; Wells-Angerer, 2005). This result could be due to user-generated terms' various and incongruent levels of description, their weak consistency and low accuracy, and the limited knowledge of the person who created the terms (Chapman, 2012). However, user-generated terms can be useful in understanding users' language and level of engagement. Social tagging can also produce faceted-tagging systems as an attempt to reduce the semantic gap between museum professionals and audiences (Chae & Kim, 2011). The advantages of user-generated terms suggest the possibility of implementing social tagging as a supplement to professional vocabulary tools (Matusiak, 2006). According to Sevim McCutcheon (2005) "the two methods [(controlled vocabulary and keyword search)] are

in fact complementary and the best solution is to use the two in combination. In other words, those with the most tools win."

Wells-Angerer states that terms created by scholars and gallery teachers obtained the best retrieval results through online database search processes (2005). Attributes created by scholars and gallery teachers indicate the use of a local taxonomy. While local taxonomy presents both compatibilities to smaller, cultural-focused collections and openness to future collections, local taxonomy's function and usability in both metadata recording and end-user searching requires more attention from the museum community and further research study.

## Research Questions and Hypotheses

My research questions revolve around the use of attributes as the descriptor in museums' digital collection databases. Specifically, I investigate: (How) Do museums create, manage, and update attributes? What are museum collection management staff's views on attributes' impact on discoverability and accessibility of museum collections, especially through online collection databases? What are the best practices for managing and updating attributes?

To answer the research questions above, first, we must understand that not all museums have public-facing online collection databases. This makes the examination of attributes difficult from an end-user' view. Secondly, museums obtain wide ranges of collections in different media, from different cultures, and reasons of based on different collecting missions. Each museum has a distinctive way of describing its collections. Due to the lack resources, managing and updating attributes may not be a priority when managing a museum collection database. Hence, attribute lists can be outdated, incapable of describing current collections, or underdeveloped. I would like to explore how museums are using and managing attributes in collection databases, present findings, and provide suggestions for best practices in collection descriptions and discoverability among museums.

## Definitions

Attributes: In this study, I will use “attributes” to refer to the equivalence of subject headings in the museum field. Depending on the institution culture, “attributes” could be called “attribute terms,” “terms,” “subject headings,” “subject terms,” “keywords,” etc.

Vocabulary tool(s): Refers to the vocabulary set a museum uses to describe the collection materials. This can include controlled vocabulary schemas, folksonomy (or local) term sets, or the combinations of the two.

Controlled Vocabulary: Refers to an authority controlled subject indexing thesaurus, such as the Getty’s *Art and Architecture Thesaurus*, the Library of Congress Subject Headings, ICONCLASS, etc.

Folksonomy: Refer to a system of vocabularies that is not authority controlled, and usually created or adopted by the individual museum to ensure compatibility and openness in describing collections at the particular museum.

## Methodology

### Overview

This is a qualitative study exploring questions related to how museums use attributes in both collection management and for online search functions. I administered a questionnaire of North American museum professionals. The questionnaire was an appropriate method in this study because it could reach participating museums in distinct collection environments and facing various collection management considerations, and respondents could participate at a time pace that was most feasible for them.

The purpose of this questionnaire was to explore the use of attribute terms in describing rare and unique objects in permanent collections at museums in North America. Questions in the questionnaire helped to collect information on museums' use of digital collection databases, to understand the creation and update plan of attribute lists (authority controlled vocabulary tools or folksonomy), and to generate recommendations for museums to manage and update their attributes that can better assist artifacts' interaction with both staff and users (See *Appendix B*). The ultimate goal of this study is to increase communications among the museum community and acknowledge different institutions on how other museums are increasing collections' accessibility and discoverability through the use of attributes. The rationale behind this study is not how individual museum staff assigns the existing attributes to collections, but how an



institution, or a collection management department, design and apply the list of vocabularies to collections that are unique to the museum.

## Sample / Research Participants

The population for this research study is the collection management staff working at museums in North America. Specifically, the sampling unit will be is the museum collection management staff who work in museums in North America and involved in creating, managing, or updating attribute terms.

This study used purposive sampling. The register at the Ackland Art Museum agreed to distribute the questionnaire to listservs from major associations in the museum community. The targeted listservs include AAMG (Association of Academic Museums and Galleries) groups and the CSAAM (Collection Stewardship of the American Alliance of Museums) listserv. Once potential participants read and agreed on the consent (See *Appendix B*), they completed the questionnaire online through Qualtrics. The questionnaire contained a section for the participant to list one's institutional affiliation and job title as well as describing the experience working with attributes at the institution.

## Questionnaire / Data Collection Methods

The data collection method for my study was a questionnaire with a combination of multiple-choice questions and open-ended questions. There are 22 questions in the questionnaire, dividing into four sections. The first section included a consent form: participants have to agree to the consent form to move forward to questions (See *Appendix B*). Participants then identified their institution and digital collection database used at the institution, including the name of the institution, job title, the current collection management system, and the person's role in managing attributes. The next

section focused on the collection database, including the functions of and access to the database relevant to the use of attributes. The next section elicited responses specifically about attributes: vocabulary tools, the creation and update plans, and level of satisfaction with attributes. Finally, participants were asked to recognize problems about the questionnaire and the study, as well as provide comments on experiences or insights to the study of attributes and descriptive vocabularies. The questionnaire was partially adapted from that of “Factors Affecting Controlled Vocabulary Usage in Art Museum Information System (2003).”

An open-ended questionnaire benefited the study by collecting data with easy-to-fill-out questions, usually multiple-choice or short answer questions, that allowed participants to explore and complete questions at their own paces, with their choices of length, focus, and languages. However, the questionnaire may not be representative of the larger population in that respondents were self-selected and could overrepresent those who have the habit of responding to listserv emails, care about the study, or personally involved in related projects.

## Data Analysis Methods

All data collected from the questionnaire was recorded in an Excel spreadsheet. Data analysis began with grouping similar answers and responses, generally falling into “positive,” “negative,” “no solution,” and “not relevant.” I recorded the number of answers to each question, and also analyzed the different reasons leading to different answers. The researcher should not go into the data collection and analyzation phase with any preconceived notions of what they will find, hence no result was pre-determined (Komiri, n.d.).

## Results

The Qualtrics questionnaire was opened for one month. Among those who started the questionnaire, 28 participants consented and completed the questionnaire.

The 28 participants work at institutions in the United States and Canada. Institutions varied greatly by locations, sizes, and functions. Seventeen participants work at museums that are affiliated with universities or colleges. The rest of the participants come from a wide range of institutions, including nationally renowned museums, state or local museums, private institutions founded for or by individual collectors, and non-profit organizations with focuses not only on exhibition and collection but also art restoration. One participant works at an international, non-profit organization primarily supporting the sharing and exchange of collections through traveling exhibitions, while another participant is affiliated with a classification system of a Canadian government agency.

Since job titles and job responsibilities are not uniformed across institutions, the results on job titles are categorized roughly into registrar, curator, collection manager, and administrator. Among the 28 participants, 11 are identified as registrar or head registrar, six are identified as curators, six are identified as collection managers or head of collection management, and two are identified as administrators. One participant has the job title of University Art Curator and Collections Manager, while two other participants are considered coordinators: one for the collection database and the other for the digital resource. Thirteen participants have worked in their institutions under the current job

titles for more than six years, six have worked between three to six years, seven are between one to three years, and only two are new to their job titles with less than one year of experiences.

Participants generally reflected a good understanding of their institutions collection management system. Among all participants, only one person does not know whether the affiliated institution uses attributes in the collection management system. Participants from 23 institutions reported that they incorporate the use of attributes, and only four reported that they do not. When asked about their role in the management of attributes, participants could choose “creation,” “management,” “regular update,” “other” with the option of typing a specific role in the text box, and “I do not manage attribute terms.” Sixteen participants have created attributes during their time at affiliated institutions, with one specified “can create if necessary.” Eighteen participants are responsible for management, and 12 for the regular updates. While three participants reported that they do not manage attribute and one skipped the question, there are also ten people in charge of the creation, management, and regular update of attributes.

The next section concentrated on the database and the search function at each participant’s institution. Participants reveal a wide range of differences in the collection database software they use. Six participants did not indicate the software their institutions use. Four institutions use TMS (The Museum System), three use Past Perfect, two use EmbArk, and two use Mimsy XG. Other institutions reported using Collector Systems, Filmmaker Pro, MuseumPlus, Proficio, ARGUS, Excel, and an original software created with PowerBuilder. Some institutions also use different systems for different collections, such as one institution uses Past Perfect for objects and Portfolio for digital assets. The

number of permanent collections appears to be another factor for institutions to determine the scale and scope of attributes. Among the participating institutions, ten have more than 20,000 objects in the permanent collections, six have between 10,000 and 20,000, and the rest have smaller collection numbers that are less than 10,000. However, it is important to note that collections can be different in formats, as institutions focusing on collecting art on papers and photographs are more likely to have a higher permanent collection number than those that collect rare and unique artifacts.

The questionnaire also asked participants about the search function designed for end-users (public users) located on an institution's webpage. Among the 28 participating institutions, only 57% reported that they have an end-user search function. Among those that provide users a way to explore the institution's collection online, only half offer users the feature to search using attributes that match those in collection databases. For those institutions, seven provide drop-down lists as a part of the attribute (or keyword) function, and one asks users to type words into the "attribute search" text box. The use of attributes also determines how museum staff interact with collections, especially for members of departments such as curatorial, education, and communications. When asked, "does the museum offer training to staff in how to use search functions in the collection database?", 26 participants offered answers: approximately 1/3 of participants stated that their institutions provide general training to all staff members. Approximately 1/3 of participants reported that their institutions do not provide any training programs, while approximately 1/3 responded that their institutions only offer training to staff from some departments or on some search functions.

The third section focus on the use of management of attributes in individual institutions. The first question asked, “what vocabulary tools are currently in use?” Participants were offered eight multiple-choice options (“check all that apply”) including some of the most popular vocabulary tools in North America, an option of “Local Treasure,” along with the option of specifying other vocabularies in use. Seven participants skipped this question. Vocabulary tools created by the Getty Research Institute are popular among institutions. Twelve out of 21 participating respondents to this question reported using Art and Architecture Thesaurus (AAT), ten using Union List of Artist Names (ULAN), eight using Thesaurus of Geographic Names (TGN), and three using Cultural Objects Name Authority (CONA). Eight institutions are using Chenhall’s Nomenclature, and five are using Library of Congress Subject Headings (LSCS) (one institution only uses LSCS for graphic materials as listed in “other”). Six participants indicated use of local thesauri to expand the coverage of vocabulary tools. One participant who selected “other,” indicated the institution modifies authority-controlled vocabularies from tools in the options to achieve the best description of collections. Another mentioned “a self-built list that applies specifically to our collection,” which should be considered as the use of a local thesaurus. Finally, one referred to the institution’s use of the Parks Canada Classification System for Historical Collections.

Out of the 19 participants who answered the creation time of the current attribute lists, five institutions adopted the current list more than ten years ago, two created between five to ten years ago, three built the list two to five years ago, three introduced the list about one to two years ago, and two have very recent attribute lists for no more than a year. However, four participants did not know when their institutions’ lists were

created. When asked, “when was the current attribute term list last updated?” nineteen participants responded, with the majority (11 people) answering “within a year,” one indicating “1-2 years ago,” one indicating “2-5 years ago,” and one selecting, “more than 5 years ago.” Two participating indicated their institutions never updated their attribute lists, while another two participants did not remember.

The following set of questions ask participants to rate their satisfaction with different aspects of current attribute lists, with 1 as the most dissatisfied and 5 as highly satisfied. Twenty participants responded to this set of questions. The average level of satisfaction with the clarity of current attributes, was 3 with a mode of 2. The satisfaction on the coverage of current attribute lists to collections was rated between 1 and 4, with an average of 2.9 ( $\approx 3$ ) and a mode of 4. Finally, the satisfaction with the current vocabulary tool(s) received scores between 1 and 4, with an average of 3.1 ( $\approx 3$ ) and a mode of 4.

The next three open-ended questions focused on participants’ personal experiences with using or managing institutional attributes. The first question was, “do the attribute terms seem to be unclear, confusing, or difficult to use in any way?” Fifteen people provided their answers with five responding “no,” and one responding “yes.” More specific answers to this question include two participants pointing out the new implementation of vocabulary tools can create difficulties for the staff. Most of the answers, however, state that current attribute lists are creating confusions or difficulties for public users and non-museum professionals, such as attributes’ heavy focus on professional languages for fine arts or Western traditions, creation of unique terms that only make sense at an individual institution, or different understandings of attributes across museum departments.

The next question was about plans to update attributes: “does your institution currently or have future plans to update or revise the current attribute terms? For what reasons?” Two participants answered “no,” and another replied “yes.” Another 13 people elaborated on their answers: nine participants expressed current or future update plan to remove confusion, better adapting to new acquisitions, expanding the end-user search function, and incorporate natural language terms, For participating institutions with no update or revision plans, reveal reasons included limited funding and time as well as the need to adopt a new collection system before reviewing the current attributes.

Finally, the questionnaire concluded by asking participants if they have comments or experience relating to their institutions’ use of attributes that they think would be valuable to share in this study. Participants shared their recent or ongoing projects regarding attributes, such as combining structures and end-goals or expanding the list to describe the diverse and increasing number of collections. Others explain how attributes work in their institutions, especially when a library is separated from the museum. Some participants also provide suggestions on choosing collection databases or vocabulary tools and suggested that best practices should reflect user experience.



## Implications

What does this all mean for museums' approaches to attributes?

Answers to the questionnaire provide insights into museums' use of attributes as descriptors and as an essential topic to be discussed within each institution and among the museum community. It is common for museums across North America to use attributes in collection databases. Factors contributing to how museums create, manage, and update attributes revealed challenges as well as opportunities for museums to acknowledge and consider.

### Creation, Management, and Update

Based on the result from the questionnaire, while 18% of participating museums do not use attributes to manage their collection records, most museums use attributes as one method to describe their collection records. While these museums use attributes, there is no consistency on which staff is in charge of managing attribute lists. In this study, participants have a wide range of job titles, from curator to registrar to coordinator, under distinct organizational charts. Almost all participants agreed that they are involved in at least one stage of managing attributes in their institutions. Participants' responses suggest that they are aware of the importance of using attributes as descriptors and see attributes as dynamic components of collection databases that require more attention.

While the data are not sufficient to draw any clear conclusions, my findings suggest that museum's decision to use attributes may correlate with the size of the

institution's permanent collection. Museums with smaller numbers of permanent collections (less than 10,000) in my study were less likely to establish attribute lists. However, there does not appear to be a no correlation between collection size, the use of attributes, and the management of attributes because the scale and scope of a permanent collection also affected by other elements such as formats and focuses of collections. Future research with a larger number of respondents could further examine these potential correlations.

I found no correlation between the use of database and attributes or the use of vocabulary tools and attributes. Museums choose collection database software from available offerings or continue to use the database software adapted by the institution years ago. These institutions also tend to use a combination of several vocabulary tools, both controlled vocabulary and local thesauri, that best accommodate local collections rather than follow a common set of professional standards.

The differences in timelines and museum development plans also contribute to the inconsistency of using and managing attributes among the museum community. Museums bringing together a diversity of disciplines as well as different languages and conceptual expectations at different times (Chapman, 2012). As a result, institutions vary in when they introduce attributes to their collection management process. Some participating museums created their attribute lists decades ago, while other institutions only established the use of attributes recently. This result indicates that while some institutions tailor their attribute lists based on recent collection development plans, others might still use attributes that are out of date. Moreover, with different creation times, institutions also demonstrate varied update plans. For example, one participant stated that

their attribute list was created more than ten years ago but never revised, while others mentioned they only created their lists within the last two years.

The lack of patterns in museums' management and update of attributes suggest that there are neither common strategies nor sharable plans among museums in North America. Although institutions make efforts to start conversations about the use of attributes, no standards have been established. While the result does not lead to a solution, it nevertheless provides possibilities. The different sizes and functions of participating institutions, varied staff titles and responsibilities related to attributes, and the distinct timeline and museum development plans all indicate that it is crucial for museums to identify peer museums within the community – similar in collection size, function, development stages, etc., and establish more concentrated conversation related to the creation, management, and update of attributes as collection descriptors with shared goals.

### Discoverability and Accessibility

An extensive attribute list not only can benefit the curation and management of a museum's collection from the within but can also advance public users' exploration and scholars' research through the outward-facing collection search function. However, not all museums consider usability, in terms of discoverability and accessibility of collections, when thinking about attributes' functions. Of the participants in this study, 43% responded that they do not have a public-facing search function for collections, while only half of the museums that offer search functions have an attribute search function that allows users to see how the institution categorize artifacts professionally. These results show that while most museums understood the common practice of using

attributes in cataloging collections, many are still not taking actions to use attributes in connecting public users to the unique artifacts in museums' collections. Many collections, if not on exhibitions, would be undiscoverable to the public otherwise.

Similar to the public functions of using attributes as a search function, attributes also play essential roles within museum services. Typically, people think that since attributes are created by the collection management department and used by the curators during accession and catalog processes, those are the only two groups of people affected by the function of attributes. However, other departments can benefit from the knowledge of attributes and skills in using attributes to search collection databases. For example, a museum affiliated with a higher education institution is often involved in education. Staff from the education department can benefit from using attributes to discover artifacts that better reflect learning objectives of visiting classes. Also, staff from the communication team can use another approach in searching for artworks for outreach programs. However, contrary to the ideal situation of promoting the use of attributes to enhance collections' discoverability among museum staff, only 1/3 of participating institutions offer training on search and the use of attributes to all staff members. Such results suggest that there is a need for increased understanding of attribute lists not only as descriptors or metadata but also as a tool to connect all aspects of museum services with its collections.

Although not all institutions adapted using attributes in end-user search functions and are aware of the benefits of enhancing collections' discoverability and accessibility, some museum staff expressed their considerations on how attributes benefit the interactions between users and museums. A participant stated,

“Attributes, keywords, standardization...whatever you are dealing with, is all about the success in a user search, more so than be super finicky about the categorization – especially if the terminology becomes outdated. In those cases, I find it important to have the information searchable, but not display.”

This participant’s statement demonstrates the public service function of attributes. The museum community needs to hear from users: not only from staff who directly interact with creating and managing attributes but also from a wide range of users who could benefit by a more comprehensive, up-to-date, usable list of vocabularies to help them better communicate with and navigate through museum collections.

## Satisfaction

Satisfaction with current attributes can provide insights into institutions’ decision making and future plans. In the section that gauged museum staff’s satisfaction with the current attribute list, questions focused on 1) satisfaction with the clarity of current attribute terms, 2) satisfaction with the coverage of current attribute terms on museum collections, and 3) satisfaction with the current vocabulary tool(s). The result of each question can be examined together with other questions in the questionnaire.

The average rating to the clarity of current attributes was 3 (neither satisfied nor satisfied), with most participants scored 2 (somewhat dissatisfied). The rating on attributes’ coverage was a little higher, with an average of 3, and most participants rated 4 (somewhat satisfied). While the average satisfaction scores seem to indicate museums’ current attribute lists are doing acceptable jobs, institutions that rate lower (1 or 2) indicate patterns. Among the nine participants who gave low scores to the clarity of their attributes, seven also gave low scores to the satisfaction of coverage. This result

demonstrates a potential correlation between clarity and coverage, which both contribute to overall satisfaction. Among the nine low-scored institutions, 67% have a small permanent collection with less than 10,000 objects, while eight institutions either did not indicate the collection database in use or use a collection database that no other participating institutions are using. Also, the same eight participants gave low scores in satisfactions with the current vocabulary tools. Comments from these participants provide context for the low scores:

- “Our current system does not have a built-in attribution list”
- “Skewed to fine art and Anglo-European Fine Art bias”
- “I think that many of the current lists are more focused on Western traditions”
- “Only registration uses a modify version of AAT to classify objects and not well understood by other departments”

Combining the representative comments with the popularity of vocabulary tools from the Getty Research Institute (five out of nine primary use vocabulary tools from the Getty), the result suggests that the nonsatisfaction of current attribute lists can be influenced by the following limitations:

- 1) the limitation of the institution’s collection database functions;
- 2) the constraints posted by popular controlled vocabulary tools that are Anglo-European and Western focused;
- 3) the barrier of using professional fine art language across museum departments.

Apart from the above representative comments, participants who offer higher satisfaction scores in all three categories also comments on issues such as unclear, confusing, or difficult in applying current attributes, such as:

- “There is some confusion with the current list”
- “At times the name attributes have an endless list of variations.... The terms relating to processes and media tend to be over-specialized for 99% of users...”
- “Sometimes we create our own naming terms for very unique object types”
- “I am the main person cataloging the terms and aim to apply them in a way to make searches successful – adding non-conforming information if necessary to make that work properly”

As some of the comments reflect to the above limitations and constraints, others also point out that under-managed and out-of-date attribute lists can lead to confusion even among collection management and curatorial professionals. Moreover, many institutions expand local thesauri to better accommodate the variation in the collection without a written plan. Situations like this can generate problems such as adding more over-specialized or non-conforming vocabularies to the lists or adding new attributes with new collections and therefore creating redundant and over-specific attribute lists.

## Best Practices

If the current attributes are not satisfying, what are institutions’ current and future plans to tackle the problems and limitations? Based on the comments from the nine staff unsatisfied about their institutions’ use of attributes and vocabulary tools, most participants appear to recognize the issue and are willing to take action. For example:

- “Possibly moving to another CMS which has an integrated attribute list”
- “No set plans, but we are considering migrating to a new CMS, which might allow us to reevaluate process”
- “Rolling reviews and updates”

- “... Need more natural language terms”

The selected comments represent different approaches for institutions to move toward more comprehensive and coherent attribute lists. Actions taken by these institutions include migrating to a new collection management system, engaging in continuous review and update procedures, and rethinking about terms in local thesauri.

Yet some institutions explain that attributes in describing collections is not their immediate concern. Reasons provided by staff from these institutions suggest “[no] time and money” and “I believe in standards, but sometimes those modes can be outdated or inappropriate.” Such statements suggest that institutions need to shift focus and resources to fulfill needs for organizing and describing collections. They also imply the urgency of introducing vocabulary tools or attribute management plans that are up-to-date and appropriate culturally to target audiences.

Where do all the results and comments lead us? There are many differences the museum community cannot mitigate, such as different organization structures and job responsibilities, decisions on the collection management system or the vocabulary tools in use, distinct collection development plan, etc. Hence, it is not realistic to establish a single standard for selecting vocabulary tools and managing attributes.

However, data gathered from the questionnaire and discussion on participants’ comments provide the museum community with the direction of working together for best practices. Firstly, the museum community can increase communications, and museums can recognize their peer museums based on the collection focuses and sizes, museum functions, user groups, etc. Within each peer museum group, members can maintain a way to share their projects of managing attributes and other essential functions



within the use of collection management systems and goals. It is also crucial for peer museums to build communications on evaluating, reviewing, and exploring possibilities in using controlled vocabulary tools while establishing local thesauri with professional considerations on the language, concepts, and usability. The ultimate goal is to introduce best practices for museums to create, manage, and update attributes and implement the list to benefit all museum functions possible; then, this study would be a starting point for museums to hear each other's voices and recognize the current steps other institutions are taking, and together building a community to achieve their goals.

## Conclusions

Seventeen years ago, Gilchest (2003) asked the question, “What factors affect the adoption and usage of vocabularies in art museum collection management databases?” Her study indicated museums’ long-standing habits and institutional traditions are significant barriers. Issues include adaptations to changes of networked resources; complex and inaccurate collection management databases and vocabulary tools; and the time spent on solving museum staff’s substantial obstacles to working with terminology projects.

Seventeen years later, although many difficulties are being addressed with the collaboration of the museum community and the development and accessibility of museum technologies, many issues remain. These include issues created by differences in institutional structures and development plans and institutional traditions of sticking with one system or adopting popular public-available vocabulary tools. As this study recognizes many of the persisting issues, it also collects voices from museums across the country and provides recommendations on working toward the attributes’ best practices in the field. Through analyzing existing differences and institutions’ needs, the study demonstrates that although institutions varied widely on the use and management of attributes, staff who holds responsibilities related to collection management are involved and often curious about enhancing functions and experience with institutional attribute lists. Therefore, suggestions regarding best practices are made, including recognizing

peer museums, establishing dynamic discussions and collaborations, and enhancing communications within the museum community.

The exploration of current approaches and future implications of attributes does not end here. Future studies could address similar research questions, focusing on peer museum groups to provide collection or function-based feedback and suggest best vocabulary tool choices and process to manage attributes. One approach is would be to interview staff responsible for attribute management. By comparing the interview results, future research could provide a workflows guideline to consolidate steps and resources for a museum's project on managing attributes. Together as a community, museums can establish conversations about describing collections records to ensure the exciting collections are bring discovered and appreciated by all museum professionals and the public.

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## Appendix A. Recruitment Email

Hello,

My name is Yuqiao Cao, and I am a graduate student at the School of Information and Library Science at the University of North Carolina at Chapel Hill. I invite you to participate in my master's paper study about the use and management of attributes (controlled vocabularies or local thesauri) in art museums' digital collection databases. This survey asks museum collection management staff for their thoughts on attributes in the collection database and the policy associated with updating and revising local attribute lists at their institutions.

Participating in this study will potentially benefit the profession in recognizing the value of developing and updating attributes and enhancing the accessibility and discoverability of artworks. This study will also benefit collection management staff by presenting the current situation and starting the conversation on using attributes as a collection descriptor.

If you are interested in participating, please take the survey at [https://unc.az1.qualtrics.com/jfe/form/SV\\_cuPu9VOJ2wvPcm9](https://unc.az1.qualtrics.com/jfe/form/SV_cuPu9VOJ2wvPcm9).

This survey should take you no more than 10 minutes to complete.



Your participation is completely voluntary. If you have any questions about the study, please email or contact me at [yuqiao@live.unc.edu](mailto:yuqiao@live.unc.edu). Thank you very much for your time!

Sincerely,

Yuqiao Cao

## Appendix B. Questionnaire

# Questionnaire on Museum Use of Attribute Terms

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### Start of Block: Introduction and Consent

The museum community has limited communications for collection management plans, and each art museum has to decide on its' use of attributes (controlled vocabulary or local thesauri; as collection descriptors, they have the same functions as subject headings in the library community) to best accommodate the rare and unique art collections. The goal of this study is to explore the function and management of vocabulary tools for collection descriptions in art museums' digital collection databases, by discovering art museums' use of controlled vocabulary or local thesauri in cataloging their collections.

As this study aims to promote communications among peer art museums and ensure institutions are on the same page in using and managing attributes, I would like to invite you to contribute your knowledge and thoughts on your institution's use and management of attributes. Participating in this study will potentially benefit the profession in recognizing the value of developing and updating attributes and enhancing the accessibility and discoverability of artworks. This study will also benefit collection management staff by presenting the current situation and starting the conversation on using attributes as a collection descriptor.

Being in this research study is completely voluntary. This study should take no more than **10** minutes, and you can agree to participate now and change your mind and stop taking the survey at any time. You can choose not to answer any question you do not wish to answer.

To protect your identity as a participant, no identifiable information will be collected, and the survey results will not be stored with your name or share with anyone. In any publication about this study, private information will not be used.

If you have any questions or concerns about this research, please contact Yuqiao Cao at [yuqiao@live.unc.edu](mailto:yuqiao@live.unc.edu).

**Please check the box below to begin the survey:**

- I agree to participate in this survey (1)

**End of Block: Introduction and Consent**

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**Start of Block: Participant's Role in the Institution**

What is the name of the institution/university you affiliated with?

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What is your job title?

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How long have you been working in this position?

- Less than a year (1)
- 1-3 years (2)
- 3-6 years (3)
- 6+ years (4)

Does your institution uses attributes in your collection management system?

- Yes (1)
- No (2)
- I don't know (3)

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What is your role in association with the management of attribute terms?

- Creation (1)
- Management (2)
- Regular update (3)
- I do not manage attribute terms (4)
- Other (5) \_\_\_\_\_

**End of Block: Participant's Role in the Institution**

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**Start of Block: Information about Collection Database**

What collection database software does the museum use? What version?

\_\_\_\_\_

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What is the total number of objects in the permanent collection?

- Less than 10,000 (1)
- 10,000 to 20,000 (2)
- More than 20,000 (3)
-

Does the museum website have an end-user search function for the database?

- Yes (1)
- No (2)

*Skip To: Q17 If Does the museum website have an end-user search function for the database? = No*

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If yes, does the end-user search tool have an “attributes search” function?

- Yes (1)
- No (2)
- Other (3) \_\_\_\_\_
- 

If yes, what is the way end-users search with attributes? type in words or the tool provides a drop-down menu for all attributes?)

- Type words into "attribute search" text box (1)
- Choose from a drop-down list (2)
- Choose from a select box (3)
- Other (4) \_\_\_\_\_
- 

Do museum staff use attributes to search for artworks?

- Yes (1)
- No (2)
-

Does the museum offer training to staff in how to use search functions in the collection database?

Yes (1)

No (2)

Only on some search functions (3)

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Only for staff from some departments (4)

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**End of Block: Information about Collection Database**

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**Start of Block: Information about Attribute Terms**

What vocabulary tools are currently in use?

- Art and Architecture Thesaurus (AAT), Getty Research Institute (1)
  - Union List of Artist Names (ULAN), Getty Research Institute (2)
  - Thesaurus of Geographic Names (TGN), Getty Research Institute (3)
  - Cultural Objects Name Authority (CONA), Getty Research Institute (4)
  - Chenhall's Nomenclature (5)
  - Library of Congress Subject Headings (LCSH) (6)
  - ICONCLASS (7)
  - Local thesaurus (8)
  - Other (9) \_\_\_\_\_
-

When was the current attribute term list created?

- Within a year (1)
  - 1-2 years ago (2)
  - 2-5 years ago (3)
  - 5-10 years ago (4)
  - More than 10 years ago (5)
  - I don't know (6)
- 




When was the current attribute term list last updated?

- Within a year (1)
  - 1-2 years ago (2)
  - 2-5 years ago (3)
  - More than 5 years ago (4)
  - Never (5)
  - I don't remember (6)
- 

Please answer the following questions by ranking your satisfaction from 1 to 5 (1 = dissatisfied, 5 = highly satisfied):

1      2      3      3      4      5



Satisfaction with the clarity of current attribute terms ()	
Satisfaction with the coverage of current attribute terms on museum collections ()	
Satisfaction with the current vocabulary tool(s) ()	

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Do the attribute terms seem to be unclear, confusing, or difficult to use in any way? What are some examples?

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Does your institution currently or have future plans to update or revise the current attribute terms? For what reasons?

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Do you have any other comments or experiences relating to your institution's use of attribute terms that you would like to share?

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**End of Block: Information about Attribute Terms**

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**Start of Block: Contact Information**

Thank you very much for your participation!

For more information about this study or comments and suggestions, please email [yuqiao@live.unc.edu](mailto:yuqiao@live.unc.edu).

**End of Block: Contact Information**

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