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The Why of the Beholder: An Analysis of the Use of Art Image Databases by Art Historians

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THE WHY OF THE BEHOLDER:
AN ANALYSIS OF THE USE OF ART IMAGE DATABASES

BY ART HISTORIANS

by

Rose Fortier

A Thesis Submitted in

Partial Fulfillment of the

Requirements for the Degree of

Master of Library and Information Science

at

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ABSTRACT

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Rose Fortier

The University of Wisconsin-Milwaukee, 2007
Under the Supervision of Dr. Iris Xie

In the field of art history, there is a great potential for the use of art image databases. However, there is little literature that deals specifically with the needs and desires of art historians when it comes to art image databases. This thesis fills the gap in the literature with a user study of the use of art image databases by art historians. It includes a survey of what databases are used, why they are used, and to what extent they are used by art history professors. Results indicate that many issues in the usability and design of currently available art image databases exist, and the implications of these issues are discussed. These issues include image quality, more diversity of images, and the need for accurate and consistent metadata. The need to use multiple art databases is explored, as well as the use of the art image database as a finding aid versus the art image database as a research tool.
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In memory of my father
Dr. Paul A. Fortier,

and for my mother
Dr. Penny Karen Gilbert.

Without whose love, support, and above all patience,
none of this would have been possible.
# TABLE OF CONTENTS

## Chapter 1. Introduction

- Introduction...........................................................................................................1
- Research Problem and Research Questions.......................................................4
- Definition of Terms..............................................................................................5
- Types of Image Retrieval Systems and Their Uses............................................7
- Importance of Study and Summary.................................................................10

## Chapter 2. Literature Review

- Introduction...........................................................................................................11
- Content-Based Image Retrieval.................................................................12
- Concept-Based Image Retrieval.....................................................................13
- Problems with Image Retrieval Systems.......................................................14
- The Gap in Research on Image Retrieval Systems.....................................15
- Summary............................................................................................................17

## Chapter 3. Methodology

- Introduction...........................................................................................................18
- Overall Design of the Research......................................................................18
- Sampling.............................................................................................................19
- Data Collection..................................................................................................20
- Data Analysis....................................................................................................22
- Validity of Data.................................................................................................24

## Chapter 4. Research Results

- Overview of the Results....................................................................................24
Available Art image databases.................................................................25
To What Extent and Why Art Image Databases Are Used.....................28
Issues of Usability and Design in Art Image Databases..........................31
Summary........................................................................................................34

Chapter 5. Theoretical and Practical Implications of the Research

Introduction...................................................................................................35
Theoretical Implication.................................................................................35
Practical Implications.................................................................................37
Summary........................................................................................................40

Chapter 6. Conclusion..................................................................................40

Study Limitations........................................................................................41
Further Research..........................................................................................42

Works Cited..................................................................................................44

Appendix A. Participating Institutions.........................................................48
Appendix B. Questionnaire..........................................................................51
Appendix C. Telephone Interview Questions............................................53
Appendix D. Annotated List of Art Image Databases.................................54
Appendix E. Questionnaire Results.............................................................59
Appendix F. Transcript of Telephone Interviews........................................65
LIST OF TABLES
Table 1. Data collection and analysis methods.........................................................23
Table 2. Art image database categories.................................................................26
Table 3. To what extent and why art image databases are used..............................29
Table 4. Features desirable for the ideal art image database....................................32
Table 5. Reasons for using a database.................................................................34
Chapter 1. Introduction

Introduction

The past decades have seen a remarkable increase in the level of computer technology. One of the areas changing the most and the fastest is the Internet, especially in the area of digital databases. What was originally conceived as a Department of Defense computer network now spreads to the corners of the world and includes a plethora of uses and users. The format of the Internet has changed over the years as well. Once a text-based, code-driven construct, it has evolved into a much more user-friendly web incorporating images into its matrix.

Not only have images been incorporated into the Internet, but databases are now being built around them. These image databases and digital libraries exist for many reasons, from commercial applications to collections of stock photography and stock illustration, to academically-based collections including databases of artwork and digitized slide libraries. Many of these collections (from commercial to academic) attempt to organize the materials contained within them. This organization exists mainly for the purpose of image retrieval, nevertheless many methods of organization exist, and yet consistent image retrieval from these databases is difficult, even for those professionals who deal with images and their meanings on a daily basis.

A large community of potential users exists in the academic discipline of Art History. These art history professionals, potentially, have great reason to use art image databases. In some institutions, conventional slide libraries have been digitized making them a powerful teaching tool, and offering better image access to students. At this basic
level, digital art collections have a great impact on teaching. At a more sophisticated level, online art image databases can potentially have a great impact on research.

Because image databases are relatively new compared to their textual counterparts, there are issues of usability to consider. Presumably, if the art databases are not easy to use, they will not be used. Many of the criteria that Saracevic uses for the evaluation of digital libraries apply to art databases as well. These criteria are outlined in Chowdhury and Chowdhury’s (2003) *Introduction to Digital Libraries*:

- **Traditional library criteria:**
  - Collection: purpose, subject, scope, coverage, authority, currency, audience, cost, format, treatment, preservation and persistence
  - Information: accuracy, appropriateness, links, representation, uniqueness, compatibility, presentation, timeliness and ownership
  - Use: accessibility, availability, searchability and usability
  - Standards.

- **Traditional IR criteria:**
  - Relevance (recall, precision, etc.)
  - Satisfaction
  - Index, search, and output features.

- **Traditional user interface criteria:**
  - Usability, functionality, effort
  - Task appropriateness, failures
  - Connectivity, reliability
  - Design features
Some of the traditional library criteria do not have as much impact on art databases as they do on digital libraries. For instance, the purpose, subject, and audience of the collection are usually very clear, with few exceptions. Art image databases are made to search for works of art, and art professionals are going to be extremely interested in them. Most of the remaining criteria, however, are extremely important for art databases as well as digital libraries. Of particular interest to this research are the criteria that deal with the ease of use of art image databases. Criteria such as accessibility, availability, searchability, usability, functionality, effort, navigation, browsing, and design features will be investigated more closely than issues that deal with information retrieval. There is a lot of research available on issues of information retrieval, and much of it may be easily applied to art image databases. The issues of overall database design are dealt with more closely than issues of information retrieval.

While the creation of image resources on the Internet continues to grow at an exponential rate, it has only been recently that researchers have started to focus on “questions underlying users’ access to images – i.e., how images are perceived and described, what information needs exist, and how users of pictorial information determine what is useful to them,” (Chen, 1999, p.292). In order to create successful image retrieval systems, the designers of the systems must understand what systems are being used, and how, and why, and by whom they are being used. The image retrieval systems will not meet the expectations of their creators and users until the background of the individuals using the systems is properly explored in order to gain a better
understanding of their needs and experiences. “The investigation of intellectual access to art images is a small piece of the retrieval problem, but the nature of how people search art images reflects the difficulty of understanding that problem,” (Hastings, 1999, p.438).

Research Problem and Research Questions

While there is a lot of research on how art image databases work, there is little information on why art image databases are used, what art image databases are used by art history professionals, and whether and to what extent art history professionals like the available features and design of currently available art image databases. This research aims to look at what art image databases are being used by art history professors, for what purpose; and what issues of design and usability exist in current art image databases.

The study focuses on art history professionals, in particular art history professors who teach at the graduate level. These individuals will most likely be employed at institutions that require them to do research. Thus, they may have had the opportunity to use art image databases in the course of their research and teaching. For the purpose of limiting the sample to manageable proportions, only art history professors employed in post-secondary institutions in the United States were recruited to take part in this research.

The questions this study addresses are:

1. What databases are available for use specifically by art history professionals?
2. To what extent do art history professionals use art databases? Why?
3. What issues exist in the usability and design of the available art databases?
I am interested in this problem because of my background in Fine Arts and in Information Science. In the course of pursuing a Master’s degree in Library and Information Science, I was struck by the fact that few art databases were capable of consistently and comprehensively providing relevant information while searching. The art image databases I looked at were adequate to perform a finding function. Finding is what occurs when a database is being searched for a known entity, either by the title or by the artist. However, the gathering function was sadly lacking. Gathering, as opposed to finding, is when a database is searched for pieces of artwork that are not known, but have similar characteristics. These characteristics (in an art setting) include medium, location, time period, and subject, among others.

I decided that in order to develop an art image database that was truly searchable, it was essential to discover what purposes it would be used for, and where current weaknesses in database design prevail. To determine those purposes, it is vital to involve those who would have the most reasons to use such a database, the art history professionals.

**Definition of Terms**

Before going any further, I will define certain terms in order to explain how they are used in the course of this research proposal.

- **Database**: a compilation of homogenous information stored in a computer or accessible online.

- **Image database**: a compilation of homogenous information in the form of visual images that are stored in a computer or are accessible online. This is the more general term used in this research proposal.
• Art image database: a compilation of homogenous information in the form of visual images of an artistic nature, usually (but not always) in an art historical context. Images in an art historical context refers to works of art, as opposed to works available commercially through organizations that deal in stock photos or stock illustrations. As with a regular database, images in an art database are also stored on a computer or available online. This is the preferred term for this research proposal. However, the art history professors who participated in the research may have had different conceptions than just this meaning of art image database.

• Digital library: Arms (2000) defines a digital library as a “managed collection of information, with associated services, where the information is stored in digital formats and accessible over a network,” (p.2). This definition is similar to that of a database with the distinction that it includes “associated services,” implying a broader scope. In the literature, the digital library has been referred to as an “electronic library” and a “virtual library.”

• Concept-based image retrieval: an approach to image retrieval where the image is indexed by a human being according to what concepts the image portrays. This indexing is often done by professionals from the field of library and information science. The indexing often makes use of metadata to aid in the organization and classification of the objects being indexed.

• Content-based image retrieval: in this approach to image retrieval “computer scientists and researchers from disciplines such as medical informatics and electrical engineering have focused on the issues of automatic indexing at the
pixel level and the implementation of new search functions,” (Chen, 2001). This indexing is done by computers, and attempts to retrieve images based on features such as color, shape, and texture.

- Metadata: in its simplest definition it is “data about data”. In a more precise definition metadata “is structured information that describes the attributes of information packages for the purposes of identification, discovery, and sometimes management,” (Taylor, 2004. p. 139). It is most often used for the organization of information that is encapsulated in a digital format.

Types of Image Retrieval Systems and Their Uses

In preparing for this thesis, I did a survey of some of the art image databases that I had available to me. I looked at three different art image databases: QBIC, ArtNET, and AMICO. The first art database is an example of content-based image retrieval, and the other two are examples of concept-based image retrieval.

QBIC (IBM's Query By Image Content):

Image retrieval systems can be divided into two main areas: content-based and concept-based. Content-Based Image Retrieval (CBIR) systems use computer indexing in an attempt to match queries to images based on the visual content of the image. They “attempt to analyze image content by applying various techniques such as edge detection (object outline); color, shape, and texture comparisons; and other basic values and properties,” (Mattison, 2004, p.1). While CBIR has shown some promise for solid objects like trademarks and logos, and for facial and fingerprint recognition, it falters when applied to art images. QBIC database is an example of CBIR. It allows the user to search the database by color and layout of images. It is possible to search the Hermitage
Museum’s collection either by image layout or by color combinations present in images. Both options have questionable retrieval at best. There are many images that did not seem to conform either to the layouts or to the color schemes used in the search. In the case of searching by layout, simple layouts worked best. I found that the color search was useful for searching images with like color palettes, but there were still many questionable matches when retrieved.

Concept-based image retrieval systems rely on humans, rather than computers, to interpret the artwork in question, and to interpret what the image represents; that is, its concept. The systems attach text-searchable metadata to an image, making it searchable with a text-based search engine. However, the process of adding the metadata can be time-consuming, and thus expensive. Below are two examples of concept-based image retrieval systems, with limitations that I noticed. It is important to note that there are many art databases available beyond the ones I have listed. Many art databases are available through universities and colleges, as well as some available through museums. However, many of these require membership at the institution to gain access to the databases.

ArtNET:

ArtNET is an art database that was created for commercial purposes. It was created as a place for dealers in art to be able to do research to discover what is available on the market. “ArtNET is the place to buy, sell and research fine art online. Our online Gallery Network is the largest of its kind, with over 1,000 galleries in 250 international cities, more than 150,000 works by over 25,000 artists from around the globe. The Network serves dealers and art buyers alike by providing a survey of the market and its
pricing trends, as well as the means to communicate instantly, inexpensively and globally.” (www.artnet.com)

This database is moderately searchable. It allows access points for Title, Artist, Work Date, Category (i.e. paintings, sculpture), Size, Subject, Style/Movement, Price, Tribe, Materials/Description, Region of Origin, and Gallery. There does not seem to be any capability for Boolean searching in the interface. It is also difficult to get to the advanced search.

AMICO:

This subscription-based art image database was created for a “not-for-profit organization of institutions with collections of art, collaborating to enable educational use of museum multimedia” (www.amico.org). In June of 2005, the database was declared inactive. It is still viewable, but no new members can join the consortium. I was able to use it on a trial basis before it was discontinued, and the active database is now the ART Image Museum Gallery, also a subscription database.

The main access points in the database were Creator Name, AMICO Contributor (museum or gallery responsible for contributing the material), Data Field, and Show All (which was similar to a browse function). From Data Field, it was possible to search much more effectively. Access points from this field included Creator Name, Creator Qualifier, Creator Nationality, Title, Creator Dates/Places, Object Type, Materials/Techniques, Creation Date, AMICO Contributor, Owner Location, Identification Number, Credit Line, Copyright, Rights, Media Metadata Rights, and Keywords. The Keyword data field allowed for Boolean searching. However, there was no way to combine the fields for searching multiple characteristics at once. The Art
Museum Image Gallery is more or less a current version of AMICO. It is owned and operated by H.W. Wilson. This gives it the advantage that it can be searched simultaneously with other WilsonWeb databases. It is touted as being a “rich digital resource of art images and related multimedia gathered from the collections of distinguished museums around the world.” I was not able to gain access to this database.

These art image databases are only a small fraction of what is actually available. Finding out what art image databases are being used by art history professors and why will help to determine what it is about those systems that are working, and what is not working.

**Importance of the Study and Summary**

A study of the experience and motivation of the individuals who make use of art databases can produce positive results when applied to the creation and evaluation of databases. When it is accurately known why the potential primary users of art databases make use, or do not make use of them, a better understanding of how to adapt databases to specific needs can occur. It is just as vital, if not more so, to know why an individual does not use databases, as it is to know why the individual uses them.

The perceptions of art historians on the abilities of currently available art databases and how they measure up in the areas of design and usability is also extremely important. These perceptions will also identify the techniques that are working in these databases, and will identify what is lacking.

In the second chapter, a discussion of the relevant literature related to image databases is presented to gain a better understanding of the context for the research. The
literature review includes background, the problems that exist in the literature on image retrieval systems, and what steps need to be taken to solve those problems.

The third chapter describes the methodology of this research. It addresses sampling, data collection methods, data analysis, and validity of data.

The fourth chapter of this thesis covers the results of the research and a discussion of those results. The fifth chapter discusses theoretical and practical implications of the research, and the sixth chapter deals with the conclusions that can be drawn from the data, the study limitations, and the need for further research.

Chapter 2. Literature Review

Introduction

Databases have existed online for decades. With the Internet explosion into the public consciousness in the mid 1990’s, many developments have taken place at an extremely rapid pace. One of these developments is the creation of image databases, more specifically the creation of art image databases. With so many developments in so little time, it is not surprising that some details, such as user studies, have been left by the wayside. This research attempts to provide information to fill that gap on the lack of user studies.

In this chapter, a cross-section of the relevant literature will be discussed to provide background information and an appropriate context for this research, to identify problems in the area of image retrieval, and to provide a discussion on the need for research that addresses the gaps in the area of image retrieval.
The literature focuses mainly on the retrieval systems themselves, and does not include comprehensive studies of how users interact with these systems from a design and usability standpoint. The literature breaks down, with a few exceptions, to two broad areas: content-based image retrieval, and concept-based image retrieval.

Content-Based Image Retrieval

There is a good deal of literature that deals with the evaluation of content-based image retrieval systems. Smith (2001), and Muller, Marchand-Maillet, & Muller (2001) provide good examples of the kind of literature already available on content-based image retrieval. Smith discusses the difficulties in developing a framework to determine the effectiveness of content-based image retrieval systems, as well as the difficulties in developing quantitative methods to measure retrieval effectiveness. Muller, Marchand-Maillet, & Muller (2001) discuss the necessity of including textual annotations to retrieve still images from image databases. In a similar vein to the articles by Smith and Muller, Marchand-Maillet, Muller, an article by Yang (2004) compares the effectiveness of different search strategies in content-based retrieval. One of the deficiencies of content-based systems discussed by Chang, Smith, Beigi and Benitez (1997) is the lack of operability between different retrieval systems. This lack of operability prevents systems from working well with each other. Also, the complexity of images makes content-based retrieval systems unwieldy to operate.

Gudivada and Raghavan (1995) discuss some of the research into content-based systems. They determine that content-based image retrieval systems are necessary to access and use the information in image repositories. Some areas of application include, but are not limited to, art galleries and museums, interior design, weather forecasting, law
enforcement and criminal investigations, and picture archiving and communication systems. However, because of the age of the article, and the advances in technology over the past 10 years, it does little more than demonstrate some aspects of the history of the field of content-based image retrieval.

**Concept-Based Image Retrieval**

The other main area of the literature is on concept-based image retrieval. This area has a longer history than its content-based counterpart because it is not wholly dependent on computers and databases and has been around since the advent of the lowly card catalogue. Concept-based image retrieval relies on human intervention in indexing and classifying images for retrieval. It is by no means surprising then, that the bulk of the literature deals with indexing. Markey (1984, 1988) discusses the indexing of visual materials. Respectively, these articles discuss indexer consistency for images, and different ways of indexing images.

Of extreme importance to the subject of indexing is the idea of controlled vocabulary as a way of maintaining consistency in the indexing of images. Petersen (1990) discusses the development of *The Art and Architecture Thesaurus* (AAT). He talks about how the AAT evolved from limited controlled vocabulary for art and architecture, and how it became a thesaurus that not only allowed indexing of images, but also allowed for openness and flexibility. Greenberg (1993), compares the AAT and the *LC Thesaurus for Graphic Materials* (LCTGM). He found that the AAT has a faceted structure and the LCTGM is more akin to a subject listing, and that each approach has its advantages and disadvantages. Tibbo (1994) brings to light the reasons behind the need to develop specialized thesauri solely for graphic images, by explaining that the controlled
vocabulary available for indexing text was completely inadequate for consistent indexing of images.

Even with the use of controlled vocabulary in the indexing of images, it seems that there are still many obstacles. Layne (1994) discusses factors to consider when indexing images. She says that indexing can lead to retrieving images in “useful groupings”. However, the problems lie in deciding which attributes of an image are most useful to identify in order to provide access to these groupings. Enser (1995) discusses subject indexing in still and moving images in his article “Progress in Documentation: Pictorial Information Retrieval”. He discusses the shallow indexing of images, and the need to find more appropriate means of indexing images. O’Connor and O’Connor (1999) address the difficulties in determining descriptors for image retrieval from one individual to the next. They discover that when asked to describe an image, people will infer things about an image that are not visually supported by that image, but may be based on their own experiences. The difficulties in indexing images for concept-based image retrieval systems can be summed up thusly: “How little information there is about the images so tantalizingly appearing on the screen, and how limited the choice of search terms.” (Roberts, 2001, p. 911)

Problems with Image Retrieval Systems

Many recent articles indicate disenchantment with content-based retrieval. Mattison (2004) states that “despite the allure of content-based image retrieval, accurate, valid, standardized, and detailed metadata is the key to precision recall of online art images.” (p.5). Other articles echo this sentiment. Chen and Rasmussen state that “Concept-based indexing has the advantage of providing a higher-level analysis of the
image content but is expensive to implement and suffers from a lack of interindexer consistency due to the subjective nature of image interpretation.” (Chen & Rasmussen, 1999, p.301). The importance of the use of metadata is stressed by Murphy (2003) in dealing with the access of images in a digital environment.

While the debate between content-based and concept-based image retrieval systems takes up a large portion of the literature, it is by no means the only literature available on image retrieval systems. There is also literature on the issues related to the creation of image retrieval systems. Besser (1990, 1991) discusses the reason for creating image databases. He looks at the issues involved in making digital surrogates for graphic images in image databases. Gupta, Santini, and Jain (1997) discuss the need for flexibility; not only in creating image databases, but in their use as well. James Turner (1999) discusses the challenges in the purposes that image databases can serve to their users, and he identifies various aspects for the most effective management of image collections. The purposes of the image databases depend on the needs of the users. The aspects of the collections can be broken down into intellectual, physical, institutional, and user aspects. Turner (2001) also discusses the management of image collection by librarians. He breaks down the different types of images that can be in any given image collection, and discusses the issues inherent to cataloguing and indexing each type.

The Gap in Research on Image Retrieval Systems

Though there is much literature available on retrieval systems, there is little available on user queries and user studies in the area of image retrieval. There is even less material available that pertains directly to art historians and their use of the databases. It is also interesting to note that most of those who are doing the research and making
developments in this field have no evident links to the field of art history. By and large, they are computer scientists and library and information science researchers. Little is being done to elicit the input of those who stand to gain the most from the research.

The research that has been done in the area of image retrieval demonstrates the gap in the available literature. Corinne Jorgensen states that “a central problem in image research: [is that] much development is ‘system-driven’ rather than user driven,” (Jorgensen, 2003). While there are some user studies of image retrieval, for instance, Hastings (1999) and Jorgensen & Jorgensen (2005), they are the exceptions. Hastings studies image retrieval by the students of an indexing and abstracting course in the School of Library and Information Science at the University of Central Florida. The Jorgensen & Jorgensen study employed “users [that] are professionals involved in advertising, marketing, graphic design, and so on” (Jorgensen & Jorgensen, 2005, p. 1348). Furthermore, the gap is exacerbated by the fact that very few of the available user studies deal with retrieving images of artwork, and only one by Chen (2001) deals with art images being retrieved by art history professionals.

Hsin-Liang Chen is one of the few researchers in the field of concept-based art database research. With articles written in the past five years, he deals specifically with art databases and their users. He is also cited in Introduction to Digital Libraries (Chowdhury & Chowdhury, 2003). Additionally, Chen has authored two pieces that deal specifically with art history and how the field relates to image databases. The first is an unpublished doctoral dissertation written in 1999: An Analysis of Image Queries and Image Retrieval Tasks in the Field of Art History (Chen, 1999). The second is a summary to that dissertation “An analysis of image queries in the field of art history,” (Chen,
The studies are quantitative analyses of the necessity for content-based image retrieval. These articles were the only ones that I was able to find relating to current user studies of art historians dealing with art databases.

Filling this gap is important if art image databases are going to be understood and more efficiently utilized by those who stand to gain the most from them. The Library of Congress’ reasons for making certain collections available online can serve as a model for the reasons these databases should be available and usable. The Library of Congress states that its pictorial materials are available “to support a variety of uses as appropriate including citation (in print and online as active hyperlinks), study and comparison, [italics are mine] convenient reproduction for classroom or personal use, and high-quality reproduction for publication,” (Arms, 1999, p. 380).

Summary

There is a great deal of information available regarding image databases and questions of image retrieval in general. A number of problems in the field come out in the research. These problems are inherent in the use of content-based image retrieval systems, specifically in making them usable in the area of art. There are also the arguments that claim that concept-based image retrieval systems are more appropriate for retrieving images of artwork. The argument is in favor of art image collections being indexed by humans. This argument leads into the problems that occur with indexing, from the creation of specialized thesauri that are appropriate for the area or art and architecture (such as AAT and LCTGM), and the difficulties with interindexer consistency in the creation of metadata for art image databases.
However, based upon the review of the literature, it is evident that there is a substantial gap when it comes to answering the research questions: do art historians use art databases; and how and why do they use them? The literature appears to focus mainly on the systems themselves, and includes relatively little about user interaction with the systems. Additionally, the literature seems skewed in favour of content-based image retrieval systems. Much more literature is available on those systems than on concept-based systems. What literature is available on concept-based image retrieval systems focuses primarily on concepts such as controlled vocabulary and indexing, interindexer consistency, the creation of concept-based image retrieval systems, and the management of image collections. It is important to fill the gap in the literature to engender a better understanding of how to apply the finding and gathering functions that databases excel at, and to apply these functions successfully to art databases.

**Chapter 3. Methodology**

**Introduction**

This chapter deals with the research methods applied in answering the research questions. Once again the questions are:

1. What databases are available for use specifically by art history professionals?
2. To what extent do art history professionals use art databases? Why?
3. What issues exist in the usability and design of the available art databases?

**Overall Design of the Research**

Multiple methods are used for this research, which contains both qualitative and quantitative approaches, in order to gain a better understanding of the reasons behind the
answers to the research questions. Because of its narrative qualities, qualitative research allows for more exploration as to the “why’s” of a question. The first portion of the research includes quantitative elements because of the nature of questionnaires. However, the portion following the questionnaire, the telephone interviews, is qualitative in nature, allowing for qualitative illumination of the quantitative data.

**Sampling**

The participants are art history professors who work at post-secondary institutions located in the US. Participants were only chosen from institutions having art history graduate programs. The participants are limited to post-secondary institutions with art history graduate programs because of the higher likelihood that the faculty at these institutions will be involved in research. These individuals are more likely to do work that requires the use of art databases.

The participants were selected from institutions all around the United States to avoid regional biases. For a list of the institutions chosen to receive questionnaires, see Appendix A., p. 48. All the professors with easily accessible email addresses received questionnaires to ensure an adequate sample size.

The questionnaire was submitted to 595 individuals. For the complete list of questions, see Appendix B., p. 51. Along with the questionnaire, participants were invited to participate in follow up telephone interviews. For the telephone interview questions, see Appendix C., p. 53. I planned for six telephone interviews, but was only able to get two.
Data Collection

For purposes of maintaining validity, multiple methods are employed. The first method consisted of a questionnaire which was distributed via email to art history professors in the U.S. who teach at post-secondary institutions with graduate programs in art history. The questionnaires were not distributed to students of art history, but included questions that investigated if the professors encouraged their students to use any art databases.

After having compiled a list of U.S. post-secondary institutions with art history programs at the graduate and/or post-graduate levels, carefully crafted questionnaires were sent out via email to the faculty of these institutions. Sending the questionnaires out by email enabled a large number of the questionnaires to be sent with little cost. It also helped to ensure a quick response rate. In order to help elicit a higher percentage of responses, a letter was mailed to those participants preceding the dispersal of the original questionnaire. A letter was sent by post in order to reach professors before the email was sent out. This way, they would be expecting the email with the attached questionnaire, and would know it was legitimate, and not spam. The letter offered to send an annotated list of art image databases compiled from the research to those who participated in any level of the research. After the questionnaires were sent out via email, three follow-up emails were sent out in order to encourage those who did not respond initially to fill out the questionnaires.

Professors with Research Assistants and Teaching Assistants doing the bulk of their online searching were asked to answer the questionnaire, if they felt they had enough personal experience with the databases. For those who did not have as much
hands-on interaction with the databases, I asked that the questionnaires be passed on to their assistants. There was an opportunity in the questionnaire to indicate the academic status of the respondent.

The questionnaire is divided into three portions. The first part asks demographic questions: the participants’ age, academic status, research or teaching focus, institution, etc. The second part focuses on the details of the participants’ use of the art databases, what databases they use, how often they use the databases, and to what ends. The third part focuses upon issues of usability and design that the participants encounter in their use of the databases.

Questionnaires are inherently quantitative in that they represent a fixed number of answers from a number of respondents. This questionnaire also contains qualitative aspects, as there are portions where the participants are able to expand upon their answers. At the end of the questionnaire was an invitation to participate in further research, in the telephone interview.

The second research method involves the voluntary participation of as many of the original respondents who agreed to participate in a telephone interview. The questions for the telephone interviews were shaped by the answers from the questionnaire. It is this phase of the research that dealt the most closely with the identification of problems and flaws with the design and usability of the art databases, and what steps could be made to improve upon these flaws.

The telephone interviews were recorded for purposes of transcription.

The questions posed to the participants in the telephone interviews were designed to have the participants elaborate upon answers elicited in the questionnaire. These
questions focus more on the usability and searchability functions of the art databases, and how it affects their use of the databases.

Data Analysis

Because the methodologies used in this research are mixed, methods beyond the simple coding of the results were necessary.

To answer the question of what databases are available to art history professors, the answers to the open-ended questions in the questionnaire were broken down into categories, and the art image databases were identified. To answer the question to what extent do art history professors use art databases, a combination of methods were used. To determine the answer to the most basic part of the question, a statistical analysis of the questionnaire results was used. In order to delve into the results in further detail, open coding of the open-ended answers to the questionnaire was used. Finally, descriptive analysis of the telephone interviews was used to offer supporting evidence to the questionnaire.

To answer the final question of what issues exist in the available art image databases, multiple methods were again employed. Open coding of the open-ended answers of the questionnaires was used as content analysis to determine the significance of the various categories of issues that became apparent. Descriptive analysis of the telephone interviews was once again used to supply supporting information.

The use of multiple methods is necessary in the analysis of this research because part of the data is qualitative in nature, and as such is unstructured in its raw form. “There is no set of rules, no simple recipe, that one can follow with unstructured data which will always be appropriate and guarantee good results.” (Boulton & Hammersley, 1996,
In this kind of analysis “data are rarely obtained in an immediately analyzable form: usually they must be prepared before analysis can begin.” (Boulton & Hammersley, 1996, p.286) As a result, I used multiple methods to prepare the data for analysis.

Qualitative and quantitative approaches to research offer different types of results. As Mildred L. Patten says: “The results of quantitative research are presented as quantities or numbers [i.e., statistics]. In qualitative research, the results are presented as discussions of trends and/or themes based on words, not statistics.” (Patten, 2004, p. 19)

For the questionnaire portion, many of the answers were entered into a table for easier analysis and statistical tabulation. The open-ended answer portions were transcribed together and annotated for easier review and analysis. The combination of table and annotation offered not only a clearer view of the data represented, but it also enabled the creation of questions for the telephone interviews.

The telephone interviews were recorded, and an accurate transcript of the entire session was created. The transcripts were analyzed and dominant themes and sub-themes were identified. The data collection and analysis methods are presented in Table 1.

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Data Collection</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>What databases are available for use specifically by art history professionals?</td>
<td>Questionnaire</td>
<td>Identification of art databases available.</td>
</tr>
<tr>
<td>To what extent do art history professionals use art databases? Why?</td>
<td>Questionnaire, Telephone interview</td>
<td>Descriptive analysis of frequency of use, and open coding of categories of reasons for using art databases</td>
</tr>
<tr>
<td>What issues exist in the usability and design of the available art databases?</td>
<td>Questionnaire, Telephone Interview</td>
<td>Open coding of categories of issues in usability and design</td>
</tr>
</tbody>
</table>
Validity of Data

The validity of the data is evident in the two methods of research used to collect data. The results of the one method were used to check against the results of the other, and vice versa. The answers given in the telephone interviews were used to back up the data uncovered in the questionnaire. Similarly, the open-ended questions in the questionnaire provided more depth to the quantitative questions of the questionnaire. The quantitative questions in the questionnaire answer “what”, while the open-ended questions in the questionnaire and the telephone interview explain “why”.

Chapter 4. Research Results

Overview of the Results

Five hundred and ninety five questionnaires were emailed to art history professors across the United States. Of those 595 questionnaires, 52 were discounted for various reasons. A number of the emails bounced back as undeliverable, and some came back with automated email responses stating that the professor in question was on vacation for the duration of the questionnaire portion of the research. These omissions left 543 questionnaires that were viable; of these 543 questionnaires, 110 responses were received, for a response rate of 20%. The questionnaires were completely anonymous, so there is no way of knowing which art history professors were from which institutions. The questionnaires were best for finding what art databases are being used and why; they could not shed much light on how the art image databases were being used. The telephone interviews were to shed more light on how the art image databases were being
used, however, the responses for the telephone interviews were extremely disappointing; I was only able to follow up with two telephone interviews.

For the two telephone interviews, Participant 1 (P1) is a male, assistant professor, between the ages of 41 and 50. Participant 2 (P2) is a female, full professor, over the age of 60. P1 works at a smaller, private institution with between 5,001 and 10,000 students, and P2 works for a large public institution with approximately 45,000 students. They both conduct research and teach. P1 has a focus area in architecture, and uses art image databases for teaching. P2 has a focus area in Asian art and uses art image databases for both teaching and research. Even though this is a very small sample size, the fact that the two participants vary so widely in background and focus means that they represent two different types of users, and are a source of supporting evidence that help explain some of the findings in the questionnaires.

The results of the questionnaire and the telephone interviews were analyzed in an attempt to answer the research questions:

1. What databases are available for use specifically by art history professionals?
2. To what extent do art history professionals use art databases? Why?
3. What issues exist in the usability and design of the available art databases?

Available Art Image Databases

While the first question was the easiest to answer, there were some results that I found very interesting. More than 20 different art image databases are specified (see Appendix D, p. 54), as well as a number of art history professors who state that they use their own personal databases, the art databases particular to the institution at which they work, museum and gallery databases, a couple of public library databases, and even
Google and Google Images. What I find surprising is not the number of different art databases, but the different kinds of databases that are represented. With few exceptions, many of the databases were created to find and view works of art, but there is a variety in the original purposes of the databases. Some of the art image databases had been created specifically by and for art history professors. I also found sites that were created to find antiques, auction sites, and photo-sharing sites, as well as the world’s most popular search engine: Google. Some of the sites serve more as portals or search engines, than strictly as databases, but they all help enable art history professors to find images of the artworks they needed. Table 2 details the different art image database categories, and their relative frequency of use.

Table 2. Art image database categories

<table>
<thead>
<tr>
<th>Type of art image databases</th>
<th>Art image databases specified</th>
<th>Number using</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subscription-based art image database</td>
<td>Amico, ArtStor, Camio, Grove Art, Prometheus</td>
<td>47</td>
</tr>
<tr>
<td>Institutional databases</td>
<td>ArtServe, Huntington Archive, MDID, OhioLink Art and Architecture Digital Media</td>
<td>36</td>
</tr>
<tr>
<td>Search engines</td>
<td>Google, Artencyclopedia.com</td>
<td>21</td>
</tr>
<tr>
<td>Museum websites</td>
<td>ARC Museum Database, Beazley Archive, George Eastman House Museum,</td>
<td>13</td>
</tr>
<tr>
<td>Art auction websites</td>
<td>Art Price, P4A.com, Sotheby’s</td>
<td>3</td>
</tr>
<tr>
<td>Library of Congress</td>
<td>American Memory Project, Historic American Building Survey</td>
<td>3</td>
</tr>
<tr>
<td>Stock image website</td>
<td>Art Resource</td>
<td>3</td>
</tr>
<tr>
<td>Public library collections</td>
<td>Not specified</td>
<td>2</td>
</tr>
<tr>
<td>Museum and gallery index</td>
<td>Art Index, Insecula</td>
<td>1</td>
</tr>
</tbody>
</table>

Another striking result is the fact that a large number of respondents state that they use two or more databases. This number breaks down to 41 of the 58 (71%) who detail what art image databases they use. This high percentage, combined with the
number of different types of sites used brings a feeling of “whatever works” for the art history professors looking for images. Participant 1, in his telephone interview mentions that he has to go multiple places to fill the gaps in the commercial and institutional databases that he has access to. “In our commercial databases, and in the university’s database, there are often gaps, and there are things such as ephemera that I simply won’t search for. Or if I need a map of Europe in 1815, I won’t even bother with our University collection. And that’s when I might go to Google, and clearly there will be lots of strange things, but usually be something that I can use, And again if I can’t, I’ll be close enough to the library, or maybe in one of my own books, that I can just do a quick scan. It really feels all kind of quick and dirty.” (Appendix F, p. 62)

In terms of what databases are being used, there are a few types that seem most prominent. The art image database that received the most responses is the commercial art image database ArtStor, with 35 of the 58 (60%) stating that they use this art image databases. 55% of database users (32 out of 58) use databases or digital collection created by the individuals’ own institutions. The third highest, 20 of 58 (34%) use Google and Google Image. While Google is a search engine, and not a database in its own right, its inclusion in the list is certainly significant. Its presence highlights some of the deficiencies that art image databases exhibit, and will be further addressed with the third research question. Seventeen percent of the respondents use unspecified museum databases, 12% use their own personal collections, and 9% of the respondents use Camio and the Web Gallery of Art.

Of these top six types of databases used by art history professors to locate artwork, only one was not created specifically for use by art historians—Google.
However, since Google casts such a wide net—with the entire visible Web at its disposal—the volume of images it has available seems to make up, in some ways, for a lack of consistent (any) indexing. However, with Google, it is also impossible to determine what it might be missing in its searches.

Not only do art history professors feel it necessary to use multiple databases to find what they need, but they also find it necessary to use multiple types of software once they have retrieved the image. Occasionally, it is necessary to go beyond art image databases, and to use print and other sources. As P1 stated in the telephone interview:

“I’ve simply accommodated myself to looking at half a dozen sources to find the images that I need. So, and I have colleagues, and we have regular discussions about this, I think a lot of people want a one source solution. In a way, I think I’ve given up on that. If I’m preparing a lecture I’ll consult the databases I’ve already mentioned, I’ll have books nearby, and I have a scanner on my desk, and a digital camera, and I’ll go to Google image search as well, I’ve also been known to use Flickr if I’m looking for images of recent buildings, for instance.”

To What Extent and Why Art Image Databases Are Used

For the second research question, “To what extent do art history professionals use art databases, and why?” the data is rather straight-forward. Of the 81 respondents who answered the question “Do you use art image databases?” 58, or 72% answer yes. Of those using art image databases, 57% use them daily or weekly. Very few art history professors use art image databases solely for research. In fact, only 6% (4 of 67) use art image databases solely for this reason. The highest percentage of users, at 45%, use art image databases solely for teaching; though this number does not differ greatly from the
percentage that use for a combination of teaching and research, with that percentage at 43%. These results are illustrated in Table 3.

Table 3. Extent of art image databases used.

<table>
<thead>
<tr>
<th>Survey question</th>
<th>Survey answer</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you use art image databases?</td>
<td>Yes</td>
<td>58</td>
<td>72%</td>
</tr>
<tr>
<td>How often do you use art image databases?</td>
<td>Daily/Weekly</td>
<td>47</td>
<td>57%</td>
</tr>
<tr>
<td></td>
<td>Monthly</td>
<td>11</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>Yearly</td>
<td>7</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>17</td>
<td>21%</td>
</tr>
<tr>
<td>Do you use art databases for:</td>
<td>Research</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>Teaching</td>
<td>30</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>Both</td>
<td>29</td>
<td>43%</td>
</tr>
<tr>
<td>How often do you search for a specific work?</td>
<td>Most of the time/Always</td>
<td>43</td>
<td>61%</td>
</tr>
<tr>
<td></td>
<td>Some of the time</td>
<td>17</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>1</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>3</td>
<td>4%</td>
</tr>
<tr>
<td>How often do you search for art by its intellectual characteristics?</td>
<td>Most of the time/Always</td>
<td>7</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Some of the time</td>
<td>28</td>
<td>41%</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>19</td>
<td>28%</td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>15</td>
<td>22%</td>
</tr>
<tr>
<td>How often do you search for art by its visual characteristics?</td>
<td>Most of the time/Always</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Some of the time</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>23</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>44</td>
<td>64%</td>
</tr>
</tbody>
</table>

The way in which the art image databases are used by the art history professors is to be expected. Most use the databases to search for works already known to them. 61% of the respondents state that they use the databases to search for a specific work that has a title or creator already known to them, either most of the time or always. Conversely, only 10% of the respondents answer that they search for artwork by its intellectual characteristics either most of the time or always. Only 3% of respondents answer that they search for artwork by their visual characteristics even some of the time. Sixty four percent state that they never searched for art by visual characteristics, and 33% answer that they rarely do so.
The results demonstrate that the majority of art history professors use art image databases as a finding aid, rather than as a gathering tool. They are mostly attempting to find specific works already known to them, rather than using the databases to gather works by a particular characteristic or combination of characteristics. This manner of searching seems to say that the databases are more useful as a teaching tool than as a research tool. Additionally, it seems that the vast majority of art history professors are using concept-based image retrieval systems. Content-based image retrieval systems work by searching for artwork by visual characteristics, yet an extremely small fraction of those searching want to search in that manner, even some of the time.

Despite all the literature discussing content-based image retrieval systems, there does not seem to be much call for this kind of system in the world of art history. The fact is that the majority of art image retrieval systems are concept-based, art history professors do not use content-based image retrieval systems; they do not search for images by using visual characteristics that would be useful in retrieving an image. The research available in content-based image retrieval systems just does not seem to apply to works of art.

“Content-based indexing is relatively inexpensive to implement but provides a relatively low level of interpretation to the image except in fairly narrow and applied domains,” (Chen & Rasmussen, 1999, p. 301). Content-based image retrieval seems to work best for images with a very narrow set of variables. It is entirely possible that works of art are simply too complex to be retrieved consistently in a content-based image retrieval system.
Issues of usability and design in art image databases

The answers to the third research question “What issues exist in the usability and design of the available art databases?” are not surprising. For the most part, many of the respondents agree that there are issues in the usability and design of the databases.

The greatest evidence of the design and usability issues is demonstrated by the commercial art image database ArtStor. ArtStor is similar to the journal archive database JSTOR. They are the brainchildren of The Andrew W. Mellon Foundation. While JSTOR provides access to digital copies of journal articles, ArtStor is a repository for digital images. Both are only available by subscription to non-profit institutions, primarily in the United States.

ArtStor is the single most-used database, with 35 individuals saying they use it, and 23 individuals willing to recommend it to their students (though a couple with caveats to the students). However, of the 35 respondents who say that they use it, 21 found it to be the most difficult of the databases that they use. That is 60% of ArtStor users. Only seven respondents find it to be the easiest to use. Difficulties with ArtStor include inconsistent image quality, cumbersome image export system, and inconsistent metadata.

When compared to the next most highly used resource, that of the institutional databases, the deficiencies become even more apparent. Of the 32 who state that they use their own institution’s database, only one person states that their institution’s database was the most difficult to use. Eleven respondents find institutional databases the easiest to use. The percentages break down to 3% who find them the most difficult to use versus 34% who find them the easiest to use. Many reasons may exist for the difference in
results. Not the least of these is the ability of an institutional database to be more flexible and to cater to a smaller, more specific group of users. It seems that ArtStor caters to many users, but few of them well.

The issues of usability and design are best illustrated by the answers to the questions in the questionnaire: “Why do you use the art image databases that you use the most frequently?” and “Please describe the features that your ideal art database would contain.” Table 4 details the areas and the frequency of the features that art history professors see as being the most desirable for their ideal art image databases.

Table 4. Features desirable for the ideal art image database

<table>
<thead>
<tr>
<th>Suggestions for changes</th>
<th>Number</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher image quality (image resolution)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher image quality-not specified</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Color management</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Zooming</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Different size files (dpi)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>38</td>
</tr>
<tr>
<td>More images</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More image-not specified</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>More non-western art</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>More architecture</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>32</td>
</tr>
<tr>
<td>Accurate image information &amp; metadata</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Better export of images</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Ease of use</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Keyword searching</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Save searches</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Faster</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Multiple views for 3D works</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Sort display results</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Thumbnails</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Reference to bibliography of artist</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>User input</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Artist biographies</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Artist name in original language</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Ability to add annotation for lectures</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
The feature listed most often for an ideal art image database is higher image quality, followed by more images, third is accurate image/data information/metadata, and fourth is better export of images. When asked in the telephone interview what features an art database of her own design would include, Participant 2 responds that “it would need thumbnails easily so you could get through a lot of materials quickly. And then large size images that one could download for teaching and research. Some method of capturing the images, so [like] a carousel or your own personal file, so that you can make your own little subset of things that you might want to use. Oh and obviously, easy to search. Good use of keywords and a systematic hierarchy classification system. I think that’s probably it.” (See Appendix F, p. 62.) These features are by far the most often suggested.

The specification of the inclusion of a classification system from P2, and the number of individuals who listed accurate metadata as important to art image databases is extremely interesting. This area of the indexing and classifying of images was one of the most prevalent in the literature that I was able to locate for the literature review. That this issue still exists, more than twenty years after Markey (1984) discusses the difficulties inherent with interindexer consistency of images, certainly implies that the issue is by no means resolved. This explains why so much literature is devoted to the issue of indexing and classification of images.

It is in this area that the inclusion of Google as an art image database becomes particularly interesting. The images in Google are extremely inconsistent in quality and size, but it seems that the sheer number of available images makes up for its shortcoming in quality.
Table 5 shows the reasons why the art history professors use the art databases that they use the most frequently. These reasons help to prove that they do not use art image databases because they think they the databases are without design flaws. In some instances on the table, it is possible to see that they use databases despite issues in usability and design.

Table 5. Reasons for using a database

<table>
<thead>
<tr>
<th>Reasons for use of database</th>
<th>Number using</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage</td>
<td>12</td>
</tr>
<tr>
<td>Image quality</td>
<td>12</td>
</tr>
<tr>
<td>Access (subscription)</td>
<td>11</td>
</tr>
<tr>
<td>Amount of images</td>
<td>10</td>
</tr>
<tr>
<td>Ease of use</td>
<td>7</td>
</tr>
<tr>
<td>Local collection (institutional)</td>
<td>5</td>
</tr>
<tr>
<td>Made by individual</td>
<td>4</td>
</tr>
<tr>
<td>Export of images</td>
<td>4</td>
</tr>
<tr>
<td>Accuracy of metadata</td>
<td>2</td>
</tr>
<tr>
<td>Image viewer/Zooming</td>
<td>2</td>
</tr>
<tr>
<td>Dependable</td>
<td>1</td>
</tr>
<tr>
<td>Ability to save images</td>
<td>1</td>
</tr>
</tbody>
</table>

The reasons given for the use of the most frequently used databases are very interesting. Coverage of the database and image quality are tied at the top, access is second, and the amount of images is third. It seems that the features most wanted in an ideal art image database, are not necessarily the same reasons that individuals will keep on using a database. Many of the top four in each category in Table 4 and Table 5 are similar.

Summary

The data collected are adequate to answer the research questions. They demonstrate that art history professors have many different resources at their command. Some are specifically created for them, while others were originally created for different
purposes and have been adapted to work as necessary. These resources are used mainly for teaching, and for some research. Additionally, most are used to perform a finding rather than a gathering function, as they are most often used to find works of art already known to the searcher. No content-based image retrieval systems are listed, and a very small number of the respondents search in a way that would work with those systems. Across the board, the databases are all examples of concept-based image retrieval systems. There are many design and usability issues detailed for current art image databases. There is a need for access to more images, images with better coverage of the various areas of art history, better quality images, and better systems to retrieve and export the images to the art history professor.

Chapter 5. Theoretical and Practical Implications of the Research

Introduction

The results of this data analysis bring out all kinds of implications regarding the state of current art image databases. Those implication can be broken down into areas of theory and practice for each of the three research questions.

Theoretical Implications

In examining the research to answer the first research question “What databases are available for use specifically by art history professionals?” one of the most apparent implications is the fact that many art history professors are not satisfied with any one database. They find it necessary to use multiple art image databases, even some that were not created specifically for art history purposes, such as Google and art auction websites. Most art history professors find it necessary to consult multiple resources, not just to find
images, but also to import them to their own computers, to edit the images when necessary, and to gather and present them. While it is undeniable that more art is available to art history professors, having to use so many different resources can also expand the amount of time spent in the process of using the images, whether for teaching or for research. As P2 says “I think the issue is that not everything is online. And that a lot of museums, a lot of collections, and so on don’t have everything online yet, and so you really can’t search everything.”

In analyzing the data to answer the second research question “To what extent do art history professionals use art databases? Why?” there are a couple of theoretical implications that present themselves. The first is that very few individuals use art image databases solely for research. This lack of use implies that most of the resources they use are simply not robust enough to support that kind of searching. The current resources are adequate for finding artwork that is already known, but they are no adequate enough to perform more complex searches where multiple works with common characteristics might be gathered together.

The second implication is that it seems that art history professors have no need for content-based image retrieval systems. None of the art history professors indicated that they use art image databases that have a content-based image retrieval system. Additionally, almost none of the professors answered that they searched in such a way (i.e. by color, texture and image shape) that would be used to search a content-based image retrieval system. Either they are unaware of the existence of these kinds of systems, or content-based image retrieval systems are simply not useful to them.
The third research question “What issues exist in the usability and design of the available art databases?” carries mainly practical implications, as opposed to theoretical ones. The issues of usability and design lend themselves best to practical solutions, and it is in this light that they will be analyzed.

**Practical Implications**

The practical implications to the first research question “What databases are available for use specifically by art history professionals?” are that art history professors must use multiple resources to find the artwork that they need. To move beyond this multiple system approach, art databases need to be more comprehensive and they need to be more user-friendly. Art image databases could be made more user-friendly by having consistently high quality images, more complete and accurate metadata, and image export systems that are less cumbersome to use and that are compatible with more systems.

For the second research question “To what extent do art history professionals use art databases? Why?” the practical implications are that the current databases are used mainly for teaching and not for research because they can not perform more complex searches to gather results. The fact that most individuals do not use the available art image databases solely for research implies that most of the resources are simply not robust enough for this kind of activity. The current resources are adequate for finding artwork that is already known, but not adequate for more complex searches where multiple works with common characteristics might be brought together. This lack of an ability to synthesize searching is a serious one. In order for searches to be more robust, the underlying metadata must be extensive and complete, and the images must be plentiful. Indexing and cataloguing of the images by using metadata is absolutely
necessary to move the available art image databases beyond being mere finding aids to becoming complex research tools. This fact is amply demonstrated through the complete lack of the use content-based image retrieval systems, as well as an almost complete lack of searching in a manner that would work on a content-based image retrieval system. It seems that content-based image retrieval systems are either not useful for art history purposes, or are not available for art history purposes.

For the third research question “What issues exist in the usability and design of the available art databases?” the findings suggest many practical implications. A number of issues present themselves time and again. Many of these issues can be addressed during the creation of the art image database.

The issue of image quality, which is one of the main concerns mentioned for art image databases, is something that should be controlled with adherence to standards when creating and adding to an art database. For the most part, the issue of image quality should be able to be controlled when the image is added to the database.

The export of images can be problematic when dealing with the need to be compatible with different systems and formats, but the problem is not insurmountable. Perhaps, instead of having one viewer or export program that works poorly for most individuals, multiple viewers could be available to download. These viewers would be crafted to address the system and presentation needs of different individuals. At this point, it would be up to the individuals to choose the one that works best for them.

The accuracy of information associated with the image and metadata can be addressed with the use of indexing and controlled vocabulary for the metadata. This feature is especially crucial in controlling the names of artists, titles of works, and place
names, all of which can have various incarnations. Controlling these names will lead to more accurate retrievals from the databases. In addition to a need for accurate metadata, a need for plentiful metadata in multiple access points is critically important. Too many databases rely on extremely basic access points, which is one reason those databases are only suitable for finding functions.

The need for more images has more than one implication. First, it is clear that more images is not an easy ideal to accomplish. There are many difficulties inherent with adding images to databases. One of the main difficulties lies in consideration of copyright. In this case, institutional databases have an edge over commercial databases, with fair use laws. However, commercial databases have better potential for adding more images because they generally have more funding and resources available to them. This difficulty can only be overcome by recognizing which images are copyrighted, and which are not; as well as making sure that they are not being misused.

Additionally, having a large number of images in an art database is not enough. The coverage of the images is also important. Many of the respondents who mentioned that they do not use art image databases did so because the databases do not cover the type of artwork that they need. Western European and American art dominates what is available. For those whose area of expertise lies outside this theatre, many of the current art image databases are useless. There are also considerations that need to be made for art that goes beyond the second dimension. Three dimensional art (sculpture and architecture), and four dimensional art (film and performance) are also underrepresented. More dimensional art is needed not simply for more representation of it, but also in
multiple views of the work, to accurately represent works which are meant to be viewed in the round.

**Summary**

There are many theoretical and practical implications that have come to light as a result of the research. Among these are the use of multiple resources by art history professors to find and use art images for teaching and research. Most individuals are using art image databases for teaching or a combination of teaching and research; with very few using them for research only. To make the systems more useful for research and teaching, they must contain more images with better coverage, beyond the traditional two-dimensional western works of art that are already so prevalent. Three dimensional works of art must include multiple views or ways of rotating around an object. The images must have a deep use of accurate metadata that addresses multiple access points, and the use of controlled vocabulary to keep this metadata consistent within an art image database. The quality of the images must be consistently good and export programs must be easy to use for many different computer system setups.

These issues must be addressed in order for art image databases to move beyond the finding aids that they currently are. I think it is extremely probative that many art historians are using the art image databases that they do, simply because they have access to them.

**Chapter 6. Conclusion**

There are many art image databases available to art history professionals. This preponderance is necessary for art history professors to be able to access the images of
artworks that they need. At this point, it takes many art image databases to find the specific images necessary for a lecture or research. However, finding images in a database is just a start. Text-based databases have developed ways to gather together like items, yet art image databases lag far behind. With the creation of more comprehensive, metadata-driven, concept-based image retrieval systems, the goal of bringing art image databases to a comparable level with text-based databases may be met. The answer to the question seems to be more; not only in number of images, but also in increased coverage of all areas of art history, and also in an increase in access points and accurate metadata. With these answers, art image database design can be reconsidered to include these features that are more related to the needs of researchers.

**Study Limitations**

Because this research is limited to art history professors, it omits the population of art historians who work in museums and in other areas outside the purview of academia. However, for the purpose of convenience, the art history professors were used, as it was easier to contact them through the email of their respective institutions. Museum personnel would have been more difficult to locate and to contact. A follow-up study comparing the use of art databases between art history professors and museum personnel would certainly be of great value, and could aid in broadening user studies in the area.

Additionally, this study does not have an international focus. In order to keep the number of people involved in the study at a manageable size, only art history professors in the United States were selected to participate. Though an international perspective could be valuable to this issue, it is simply too cumbersome to manage at this point.
This study only dealt with art history students in a peripheral manner, as the questionnaire did not include them as participants. Some of the questions posed in the questionnaire and in the telephone interviews included questions about how much the professors knew about art image databases used by their students. More specifically these questions dealt with whether or not the art historians recommend art databases to their students, and what, if any, art databases they recommend. These recommendations served to see which art databases these art historians found most reliable.

This study does not deal with individuals outside of the art history fields who are using art databases for personal research. It is difficult to find casual users who are outside of a defined user group, and the time period allotted for the research prevents the setting up of online surveys on the available art databases. Once again, this is a topic for future research.

Because of the nature of questionnaires, those who answered the questionnaire, and those who agreed to go further and take part in the telephone interviews, may have been self-selected. As a result, they may have had stronger opinions than the average representative of the population that has been selected. This strength of opinion resulted in greater richness of results in the qualitative portions of the questionnaire.

Further Research

This research has also uncovered the need for further research to gain a better understanding of some of the research questions. In particular, the methods used in this study, the questionnaire and the telephone interview, helped in answering the questions of what and why art history professors use in the way of art image databases. However, a series of experimental studies would be extremely valuable to look at how art history
professors use art image databases. In particular, a series of experiments conducted by applying transcription logs to analyze queries and search strings, and using think-aloud methods while art history professors use these databases would be invaluable to see what search strategies the professors use within databases, and how they overcome difficulties they encounter while searching.

To see why content-based image retrieval systems are not being used by art historians, a series of experiments would be extremely useful. In order to find out if they are simply not aware of the existence of such systems, a questionnaire would be used. To find out how they use the systems, and what their opinions are on the available art image databases that use content-based image retrieval, an experiment could be conducted where they use the databases in a controlled environment. Afterwards, interviews would be used to capture their reactions to the databases.
Works Cited


Appendix A. Participating Institutions

Boston University
Brown University
Bryn Mawr College
Case Western Reserve University
Duke University
Emory University
Florida State University
The George Washington University
Harvard University
The John Hopkins University
Northwestern University
The Pennsylvania State University, University Park Campus
Stony Brook University, State University of New York
Temple University
The University of Arizona
University of California, Berkeley
University of California, Irvine
University of California, Los Angeles
University of California, Santa Barbara
University of Chicago
University of Delaware
University of Illinois at Chicago
University of Illinois at Urbana-Champaign
The University of Iowa
University of Kansas
University of Louisville
University of Maryland, College Park
University of Michigan
University of Minnesota, Twin Cities Campus
University of Missouri- Columbia
University of Missouri-Kansas City
University of New Mexico
The University of North Carolina at Chapel Hill
University of North Texas
University of Oregon
University of Pennsylvania
University of Pittsburgh
University of Rochester
University of Southern California
The University of Texas at Austin
University of Virginia
University of Washington
University of Wisconsin-Madison
University of Wisconsin-Milwaukee
Virginia Commonwealth University
Washington University in St. Louis

Yale University
Appendix B. Questionnaire

Name of Institution:______________________________

What type of institution do you work for?
- Teaching
- Research
- Personal
- Other (Please specify)______________

Gender
- Male
- Female

Age
- Under 30
- 31-40
- 41-50
- 51-60
- Above 60

Academic Status
- Assistant Professor
- Associate Professor
- Professor
- Research Assistant
- Teaching Assistant
- Other (Please Specify)______________

How often do you use art databases?
- Daily
- Weekly
- Monthly
- Yearly
- Never

What art databases do you use? Please List:
__________________
__________________
__________________

In general, to what extent do you find art databases easy to use?
- Not at all
- Rarely
- Some of the time
- Most of the time
- Always

Do you use art databases for:
- Research
- Teaching
- Both
- Nothing
- Other (Please specify)______________

If you wish, please provide some background for the research or teaching you are involved in:

Do you recommend using art databases to your students?
- Yes
- No

If Yes, please list the databases you recommend to your students.
__________________
__________________
__________________

To what extent do your searches in art databases meet your expectations?
Not at all  Rarely  Some of the time  Most of the time  Always

How often do you find art that you know well? (i.e. Knowledge of title, or creator of work)
Never  Rarely  Some of the time  Most of the time  Always

How often do you find art you do not know well? (Without the knowledge of the title or creator of work, e.g. all works with a particular characteristic.)
Never  Rarely  Some of the time  Most of the time  Always

Do you use controlled vocabulary if available? (i.e. thesaurus, subject headings, classification, or set categories)
Not at all  Rarely  Some of the time  Most of the time  Always

Do you use keyword searches?
Not at all  Rarely  Some of the time  Most of the time  Always

What is your favorite art database and what are the features that you like?

What is your least favorite art database and what are the features that you dislike?

What are some major problems in the use of your favorite art database?

What are some major problems in the use of your least favorite art database?

Please describe the features that your ideal art database would contain.
Appendix C. Telephone Interview Questions (Questions are with the understanding that they will most likely change as results from the questionnaire becomes available.)

Which art database or art databases do you sue the most?

Which one do you like the most? Which one do you like the least?

What suggestions do you have for improvement for any or all of these databases?

If you could design and art database that would work best for your personal needs, what features would you include?

What kind of search strategies do you sue when searching art databases?

How often do you find your searches to be successful?

Do you spend less time looking for images now, than before art databases were available?

What do you think are the biggest strengths in today’s art databases?

What do you think are the biggest areas in need of improvement?
### Appendix E. Questionnaire results

#### What type of institution do you work for?

<table>
<thead>
<tr>
<th></th>
<th>Response Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>57</td>
<td>64%</td>
</tr>
<tr>
<td>Private</td>
<td>28</td>
<td>31.5%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>4</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

Total Respondents 89
(skipped this question) 0

#### How many students does your institution teach?

<table>
<thead>
<tr>
<th></th>
<th>Response Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2500</td>
<td>1</td>
<td>1.1%</td>
</tr>
<tr>
<td>2,201-5,000</td>
<td>4</td>
<td>4.5%</td>
</tr>
<tr>
<td>5,001-10,000</td>
<td>12</td>
<td>13.5%</td>
</tr>
<tr>
<td>10,001-20,000</td>
<td>34</td>
<td>38.2%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>37</td>
<td>42.7%</td>
</tr>
</tbody>
</table>

Total Respondents 89
(skipped this question) 0

#### In your work do you focus more on:

<table>
<thead>
<tr>
<th></th>
<th>Response Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>6</td>
<td>6.7%</td>
</tr>
<tr>
<td>Teaching</td>
<td>2</td>
<td>2.2%</td>
</tr>
<tr>
<td>Both</td>
<td>72</td>
<td>80.9%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>9</td>
<td>10.1%</td>
</tr>
</tbody>
</table>

Total Respondents 89
(skipped this question) 0

#### Age

<table>
<thead>
<tr>
<th></th>
<th>Response Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 and under</td>
<td>1</td>
<td>1.1%</td>
</tr>
<tr>
<td>31-40</td>
<td>25</td>
<td>28.4%</td>
</tr>
<tr>
<td>41-50</td>
<td>24</td>
<td>27.3%</td>
</tr>
<tr>
<td>51-60</td>
<td>24</td>
<td>27.3%</td>
</tr>
<tr>
<td>Over 60</td>
<td>14</td>
<td>15.9%</td>
</tr>
</tbody>
</table>
Total Respondents | 88
---|---
( skipped this question) | 1

### Academic Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Response Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistant Professor</td>
<td>26</td>
<td>29.2%</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>24</td>
<td>27%</td>
</tr>
<tr>
<td>Professor</td>
<td>28</td>
<td>31.5%</td>
</tr>
<tr>
<td>Research Assistant</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Teaching Assistant</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>11</td>
<td>12.4%</td>
</tr>
</tbody>
</table>

Total Respondents | 89
( skipped this question) | 0

If you wish please provide some background for any research or teaching you are involved in:

Total Respondents | 29
( skipped this question) | 59

### Do you use art image databases?

<table>
<thead>
<tr>
<th>Response</th>
<th>Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>58</td>
<td>71.6%</td>
</tr>
<tr>
<td>No</td>
<td>23</td>
<td>28.4%</td>
</tr>
</tbody>
</table>

Total Respondents | 81
( skipped this question) | 8

If no what sources do you use in the place of art image databases?

Total Respondents | 31
( skipped this question) | 58

How often do you use art image databases?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>21</td>
<td>25.6%</td>
</tr>
</tbody>
</table>
Weekly: 26 (31.7%)
Monthly: 11 (13.4%)
Yearly: 7 (8.5%)
Never: 17 (20.7%)
Total Respondents: 82
(skipped this question)

What art image databases do you use? Please list in order from the most frequent to the least frequent.

Total Respondents: 62
(skipped this question)

In general to what extent do you find art image databases easy to use?

<table>
<thead>
<tr>
<th>Response</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>7</td>
<td>9.9%</td>
</tr>
<tr>
<td>Somewhat</td>
<td>17</td>
<td>23.9%</td>
</tr>
<tr>
<td>Moderately</td>
<td>20</td>
<td>28.2%</td>
</tr>
<tr>
<td>Mostly</td>
<td>20</td>
<td>28.2%</td>
</tr>
<tr>
<td>Very</td>
<td>7</td>
<td>9.9%</td>
</tr>
</tbody>
</table>

Total Respondents: 71
(skipped this question)

Do you use art image databases for:

<table>
<thead>
<tr>
<th>Response</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td>Teaching</td>
<td>30</td>
<td>44.8%</td>
</tr>
<tr>
<td>Both</td>
<td>29</td>
<td>43.3%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>4</td>
<td>6%</td>
</tr>
</tbody>
</table>

Total Respondents: 67
(skipped this question)

Do you recommend using art image databases to your students?

<table>
<thead>
<tr>
<th>Response</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>45</td>
<td>61.6%</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>38.4%</td>
</tr>
</tbody>
</table>
If Yes please list the art image databases you recommend to your students.

To what extent are you satisfied with the art databases that you use?

<table>
<thead>
<tr>
<th>Response</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>7</td>
<td>10.1%</td>
</tr>
<tr>
<td>Somewhat</td>
<td>21</td>
<td>30.4%</td>
</tr>
<tr>
<td>Moderately</td>
<td>22</td>
<td>31.9%</td>
</tr>
<tr>
<td>Mostly</td>
<td>14</td>
<td>20.3%</td>
</tr>
<tr>
<td>Very</td>
<td>5</td>
<td>7.2%</td>
</tr>
</tbody>
</table>

How often do the results of your search meet your expectations?

<table>
<thead>
<tr>
<th>Response</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>5</td>
<td>7.5%</td>
</tr>
<tr>
<td>Rarely</td>
<td>6</td>
<td>9%</td>
</tr>
<tr>
<td>Some of the time</td>
<td>36</td>
<td>53.7%</td>
</tr>
<tr>
<td>Most of the time</td>
<td>19</td>
<td>28.4%</td>
</tr>
<tr>
<td>Always</td>
<td>1</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

How often do you search for a specific work? (e.g. Knowledge of title or creator of work)

<table>
<thead>
<tr>
<th>Response</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>3</td>
<td>4.3%</td>
</tr>
<tr>
<td>Rarely</td>
<td>7</td>
<td>10%</td>
</tr>
<tr>
<td>Some of the time</td>
<td>17</td>
<td>24.3%</td>
</tr>
<tr>
<td>Most of the time</td>
<td>36</td>
<td>51.4%</td>
</tr>
<tr>
<td>Always</td>
<td>7</td>
<td>10%</td>
</tr>
</tbody>
</table>
How often do you search for art by its intellectual characteristics? (Without the knowledge of the title or creator of work e.g. all works with a particular characteristic or combination of characteristics such as date medium subject.)

<table>
<thead>
<tr>
<th>Response</th>
<th>Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>15</td>
<td>21.7%</td>
</tr>
<tr>
<td>Rarely</td>
<td>19</td>
<td>27.5%</td>
</tr>
<tr>
<td>Some of the time</td>
<td>28</td>
<td>40.6%</td>
</tr>
<tr>
<td>Most of the time</td>
<td>6</td>
<td>8.7%</td>
</tr>
<tr>
<td>Always</td>
<td>1</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

Total Respondents | 69
(skipped this question) | 20

How often do you search for art by its visual characteristics? (e.g. color texture composition)

<table>
<thead>
<tr>
<th>Response</th>
<th>Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>44</td>
<td>63.8%</td>
</tr>
<tr>
<td>Rarely</td>
<td>23</td>
<td>33.3%</td>
</tr>
<tr>
<td>Some of the time</td>
<td>2</td>
<td>2.9%</td>
</tr>
<tr>
<td>Most of the time</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Total Respondents | 69
(skipped this question) | 20

Do you use controlled vocabulary if available? (e.g. thesaurus subject headings classification or set categories)

<table>
<thead>
<tr>
<th>Response</th>
<th>Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>24</td>
<td>35.3%</td>
</tr>
<tr>
<td>Rarely</td>
<td>14</td>
<td>20.6%</td>
</tr>
<tr>
<td>Some of the time</td>
<td>20</td>
<td>29.4%</td>
</tr>
<tr>
<td>Most of the time</td>
<td>9</td>
<td>13.2%</td>
</tr>
<tr>
<td>Always</td>
<td>1</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

Total Respondents | 68
(skipped this question) | 21
Do you use keyword searches?

<table>
<thead>
<tr>
<th>Response</th>
<th>Total</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>9</td>
<td>13%</td>
</tr>
<tr>
<td>Rarely</td>
<td>4</td>
<td>5.8%</td>
</tr>
<tr>
<td>Some of the time</td>
<td>26</td>
<td>37.7%</td>
</tr>
<tr>
<td>Most of the time</td>
<td>25</td>
<td>36.2%</td>
</tr>
<tr>
<td>Always</td>
<td>5</td>
<td>7.2%</td>
</tr>
</tbody>
</table>

Total Respondents: 69
(skipped this question)

What art image databases do you find most difficult to use?

Total Respondents: 50
(skipped this question)

What art image databases do you find easiest to use?

Total Respondents: 47
(skipped this question)

Why do you use the art image database that you use the most frequently?

Total Respondents: 53
(skipped this question)

Please describe the features that your ideal art database would contain.

Total Respondents: 60
(skipped this question)
Appendix F. Transcript of telephone interviews.

Telephone Interview
Participant 1
3:00 PM, 9/14/06

Interviewer: This is for my thesis “The use of art databases by art historians”, do you have any questions before we start?

Participant: No I don’t, I only have a caution…that is that I have been on leave the past year. So school just started up again, and I’ve refamiliarized myself with a number of the databases, but a lot has probably changed in the last year, when I haven’t been actively using them.

Interviewer: Well, what I have are more general questions on your impressions, so hopefully that won’t be too much of an issue.

Participant: Okay.

Interviewer: Now some of these questions you’ve probably already answered, but if I can just get any clarifications or any further stuff you may have thought of.

Which art database or art databases do you use the most?

P: I use our school has a version of [Luna Insight], so that I probably use the most. I have use Artstor, and I have used… I guess the other thing I now use the most is actually a personal collection that, with the help of a grant from the university, I scanned several thousand photos from the photo collection, that were otherwise not available. So I now have something like eight or nine thousand images in a personal databases, and that operates with [Extensis] portfolio.
I don’t know if that qualifies as databases that you’re thinking of.

I: No actually, anything and everything, basically.
So which one do you like the most?

P: They all have their advantages and disadvantages. The Luna insight interface is, I find, is very unintuitive, and pokey to operate, and also often, it’s sometimes a little difficult to get images from, and ultimately I end up using all of these in teaching, any publication, it’s a different process. So, Luna insight has a lot that I’ve asked the university to put into it. There are a lot of images from before I got here, and it’s fairly broad, but as I said it’s the interface that I don’t enjoy at all. And its own viewer I don’t’ find flexible enough.
Extensis portfolio is great in terms of usefulness as a program, but its coverage is and this is my own collection, its coverage is spotty, it depends on what sort of class I’m teaching. ArtStor is, for instance, fairly weak in terms of modern architecture, which is what I teach a lot of.

I: What suggestions would you have for improvement for any or all of these databases?
P: Yikes, I think, ease of use, certainly, ease of export of the image and of low res form. I understand there are lots of copyright issues. Quality enough to just project in a small classroom, basically. And that’s not always the case. I have to say, one thing that is, I’ve simply accommodated myself to looking at half a dozen sources to find the images that I need. So, and I have colleagues, and we have regular discussions about this, I think a lot of people want a one source solution. In a way, I think I’ve given up on that. If I’m preparing a lecture I’ll consult the databases I’ve already mentioned, I’ll have books nearby, and I have a scanner on my desk, and a digital camera, and I’ll go to Google image search as well, I’ve also been known to use [Flickr] if I’m looking for images of recent buildings, for instance.

I: Wow, it seems like a whole range of things then.

P: Yeah, and I’d love for it to all be in one place, but it almost seems unreasonable to expect that. So I’m simply kind of accustomed to that, and on top of that, even in terms of viewing software, I’ll even have a few different programs open, from Photoshop if there has to be some serious manipulation to just a straight viewer of [Picasa] from Google, if there are some minor fixes that an image needs.

I: That’s sort of interesting. I never considered that beyond the actual finding of the image that you would actually have to mess with it.

P: I mean what I’ve noticed is that when I prepare a lecture, I’ll have image acquisition software open from a browser to one of the databases, then there will be some sort of manipulation, again, it depends how much I need to do for the image. Then there will be some sort of cataloguing and that can range anywhere from renaming files, just putting them in nested folders, to running portfolio, and finally presentation software, often PowerPoint.

I: And you sort of have to bring these all in, there’s nothing that sort of packages it?

P: No, and it would be fantastic, though I can’t imagine such a thing, because they’re all such different tasks. But there are definitely four classes of software, and I’ll often have one or two of these open at a time and then just I feel comfortable now, going through all of them

I: Okay. If you could design an art database that would work best for your personal needs, what features would you want specifically? We probably went over some of these already but…

P: Yeah, I guess I would separate out the database itself, that is the content from the interface. IN the database, I would want the possibility for everything, and by everything I mean, because I teach buildings, it sometimes takes me 20 separate images to explain a building to a class. As opposed to say, an easel painting. I often also use ephemera such as exhibition catalogue covers or even popular culture images to make smaller points or
to illustrate more general ideas or just to make a transition between two big themes in some particular lecture. And while some of this is more or less set, there are certain buildings that I’ll talk about a lot, I think that particular lecture changes from year to year, depending on how I feel, or what I’ve read recently, and that keeps it fresh for me. So I like the idea that the database itself, or the universe of images that I search, to be as large and unpredictable as possible. The interface would be great if it could search multiple databases. And right now, you’re kind of talking about what I would dream of. And then something that would allow me to make really minor fixes, improve contrast, rotate something, do a little bit of cropping, and not much more, and then something that might prompt me for some keywords, or artist name or location as well. That would be an amazing tool.

I: When you’re searching, what kind of search strategies do you use. And I think in this, I’d like to focus more on the databases and less on something like Google Images.

P: Well, I typically, I think I’ve inherited the kind of categorization of a lot of architectural slide libraries, which is geographically based. So, I will often, if I think of a building it will be in a specific place, or tied to a specific architect. If it’s not, and definitely I’m talking about vernacular architecture, things like the American bungalow, it could be much more generic, in which case I would start needing keywords.

I: So it sounds like more often you sort of know what you’re looking for than?

P: Yes, I think that’s true. And even with Google image searches, I’ll try to be as specific as possible in terms of keywords. Ideally though, I would look under an architect or a place depending on what the class or lecture was, and then call up the range of images that I have for that architect, and then kind of decide from there. So I’d be specific to a certain point, I know I want to talk about Frank Lloyd Wright, so let me look at everything from Frank Lloyd Wright, everything from 1900 to 1910. That would be a great search,. Then I can see what looks good, what makes sense to me.

I: How often do you find those searches to be successful? I mean do you notice that there are things that you think ought to be there but aren’t, or things that are brought up that have absolutely nothing to do with what you’re looking for?

P: Yes to both. In our commercial databases, and in the university’s database, there are often gaps, and there are things such as ephemera that I simply won’t search for. Or if I need a map of Europe in 1815, I won’t even bother with our University collection. And that’s when I might go to Google, and clearly there will be lots of strange things, but usually be something that I can use, And again if I can’t, I’ll be close enough to the library, or maybe in one of my own books, that I can just do a quick scan. It really feels all kind of quick and dirty. Basically whatever works, but by the time you’ve looked through all the different sources, something will have worked. And then the other part of that is that if there’s no way for me to get the image I want, then the lecture changes a bit, which is how it used to be just 10 years ago when I was limited to the slides that were
already collected in the slide library. As an art historian, everything is heavily dependent on the images.

I: So do you think that overall what is happening now is better than what you had, say 10 years ago?

P: I think so, its’ very different. And the way I’ve been able to kind of tell the story to myself is that in the old days, meaning 10 years ago, I would go to the slide library and pull out whatever images we had on, let’s say, London, I want to give a history of London. And depending upon the images we had, that’s how the narrative part of the lecture would be shaped. So the available images would drive the narrative. What happens now is almost the reverse, where I can actually think of the narrative first and then always find ways to illustrate it because there is so much of a bigger universe of images possible. So in a funny way it’s almost… in theory it could be a stronger lecture because it could be exactly what I want it to be in conceptual terms. But on the other hand, it’s sometimes, the images, and I have to guard against this, the images become more illustrations to a story, as opposed to objects we really focus on. So it’s not hard to pay attention to that, but I’ve noticed that the tendency is to illustrate more, which I think non-art historians do, which I think the images for us are the content.

I: Do you spend less time looking for images now, than you used to, or more time?

P: Probably, more time because, in the past again, they were all sort of all more in the library, and where I would spend more of the time in the past would be look in the slide library, see what we have, figure out what’s missing, at least for my purposes, and then go to the book library, get out the books, and have slides made. And the disadvantage there, and maybe it’s an advantage [is that it was all in one place. And now I can look anywhere at anytime, whether it’s in my office, at the library, or with my] laptop at the podium and pick up an image in the last second. That image seeking time is much more dispersed throughout the day.

I: What do you think are the biggest strengths in today’s art databases?

P: You’re thinking in terms of the commercial…

I: Yeah.

P: Strengths, I think typically the quality of the images. It’s better than what you can find randomly on a Google search, it’s not better than the slides. I guess the flexibility is certainly one thing. The searchability is another thing. The range in comprehensiveness really varies. So if I wanted to look at the Illustrated [Barch], that’s all there but if I wanted to look at the architecture of Amsterdam in the last 10 years, that won’t be anywhere. I’m not quite sure how to answer that question. I guess I just know them as one more resource to look into.
I: Okay, and what do you think are their bigger weaknesses, which might be an easier question to answer.

P: Yeah, I think sometimes the spottiness of coverage, but again I’ve simply come to accept that. In some cases, the user interface.

I: When it’s not intuitive or

P: Yeah.

I: That’s pretty much all I have, so thank you for doing this.

Telephone Interview
Participant 2
4:00 PM, 9/14/06

Interviewer: Do you have any questions for me before we start?

Participant: Not really I guess, whatever you need, I’ll try to help.

M: Okay. Some of these questions may seem a little bit repetitive from the initial survey, but I’m hoping to get elaborations and that sort of thing on some of them. Which art database do you use the most?

P: Probably the Huntington archive that is what we have right here for our own materials.

I: Have you ever used any of the other ones that are available?

P: Well, ArtStor and I use a number of things on individual museums. Like right now, I’m using the one for the Minneapolis Institute of Art, I’m giving a lecture there so I’ve been using their database. I just go on like Los Angeles County Museum, or any of the others when I need something from that museum.

I: Sure,

P: And then the American Institute of Indian Studies. I use that.

I: How do you think they sort of stack up against each other?

P: Well, it sort of depends in terms of the coverage of the material. Obviously something like ArtStor is the most comprehensive, but the Huntington covers mostly what I am needing, so I use that a lot, and the others, it just depends what’s in the collection.

I: Okay. Of the ones you’ve used, which is your least favourite?

P: I really can’t say.
I: Nothing stands out?

P: Nothing stands out, no.

I: Which is probably a good thing. If you could design an art database for your personal needs what features would you include?

P: Well it would need thumbnails easily so you could get through a lot of materials quickly. And then large size images that one could download for teaching and research. Some method of capturing the images, so a carousel or your own personal file, so that you can make your own little subset of things that you might want to use. Oh and obviously, easy to search. Good use of keywords and a systematic hierarchy classification system. I think that’s probably it.

I: When I was going through the results of the survey, I noted that a lot of people have a problem with the quality of the images. Is that something that you run across that they’re not necessarily of a very good quality?

P: Well the ones on the Huntington, we do have high resolution images available. I think that you could always get high resolution, which of course makes the database slow too, if you’re just trying to go through the materials. I know that ArtStor, the problem used to be low resolution, but my understanding is, and I haven’t used it over the summer, they have tried to improve the quality, but there used to be very low resolution.

I: Okay. When you’re using art databases, what kind of search strategies do you employ?

P: Well, I usually try to search for either the subject matter, of the certain period, or the material, depending on what I need.

I: So you’re generally going in sort of knowing what it is that you’re looking for?

P: Yeah.

I: Okay. Overall, what do you see as the biggest strengths for the art databases that you use?

P: Obviously it makes it much easier to teach using PowerPoint or electronic materials. I think the strength is it really is, it makes these materials available at the click of a key. So I think it’s fantastic to have all that available.

I: Okay, so it definitely sort of speeds up the process?

P: Right, and it enlarges it. There is much more that we can have access to than we would if we were just using our own slide room or visual resources library, something like that.
I: Okay, what do you think the biggest weaknesses are then?

P: Well, I think the issue is that not everything is online. And that a lot of museums, a lot of collections, and so on don’t have everything online yet, and so you really can’t search everything.

I: Great, well that’s pretty much everything I have.

P: Great, so what is it that you’re looking for? Are you looking to try to make recommendations about what databases should be, what is it you’re actually trying to do with your thesis?

I: Basically, my thesis I’m trying to answer three questions: What databases are available to art historians, how and why do they use them, and what issues exist in the usability of the available art databases. Those are the three research questions for my thesis. Basically, the reason why I’m doing this my Master’s level thesis, and I basically want to use this as a springboard to when I go for my PhD, where I want to actually try creating a database with images that addresses some of these issues that are coming up.

P: That’s great. I’d love to see, because we do have the database that we use for the Huntington archive and if there are things that pop up, you probably don’t have a lot of other people that use it, because it’s specialized in the art of Asia, but if there are some suggestions that come to light, or just general things that people find problematic with databases, then I would love to know about it, because we would love to try to improve.

I: Oh sure. Thank you so much.