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Finding Visual Information: A Study of Image Resources Used by Archaeologists, Architects, Art Historians, and Artists

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This article presents the findings of a recent study which identified the image resources that professional user groups acknowledged were useful to their work processes. The information behaviors relating to images of several professional user groups—archaeologists, architects, art historians, and artists—were examined in a qualitative research study conducted in 2008-2009. Presented here are findings that clarify where these patrons turned for their visual information needs and what factors influenced their image resource decisions. The final section provides suggestions to improve the image-related experiences of these user groups and discusses avenues for future research.

Introduction

In this study, image resources are defined as any observable material which can be employed by a professional user to complete a work task. The format of current image resources can be print, digital, or real, lived experience. Resources may be held within personal or institutional collections, in specialty databases, or on the open web. Access to image resources may be freely granted, restricted, or prohibited, while the use of the images contained within these resources can be similarly diverse. Users who attempt to meet their image needs to complete their work tasks operate within this complicated set of conditions.

For a number of professional user groups in the academic and creative disciplines, visual information plays a central role in the work they complete. While many studies have acknowledged this need for visual information among various user groups, few studies address the image resources used by archaeologists, architects, art historians, or artists. A review of the literature reveals varying levels of research regarding the image behaviors of these groups. An overview is presented below, arranged from the least to the most fully researched group.[1]

Investigations of these user groups which are general in nature are provided when their findings present information that impacts the selection and use of image resources. A multidiscipline study of image users across a university campus is discussed at the end of this section as its findings add to the understanding of the broad need for images in the academic setting. Two additional notable aspects concerning the literature found and presented here should be mentioned. First, of the existing studies which examined image users' behaviors, many were found to focus solely on image needs and image retrieval. Second, fewer discussions addressing the topic of image resources were found in the literature. This situation set the foundation for the current study's examination of the image resources used by professional user groups.

Literature Review

Archaeologists

Studies of archaeologists' information behaviors are rare. Two recent studies by Isto Huvila published in 2008 and 2009 examined the use of information sources by archaeologists with varying work roles and found that visual information in various forms was sought.[2] The most extensive use of visual information was found for academic archaeologists involved in teaching; these materials consisted of diagrams, videos, photographs, and the objects themselves.[3]

Several other articles have been published within the past few decades on image-rich systems and technologies useful for the discipline of archaeology. These include discussions of the Digital Archive Network for Anthropology (DANA),[4] the Perseus Digital Library,[5] and multispectral imaging techniques.[6] Geographic Information System (GIS) technology has also seen heavy adoption among the archaeological community. However, no studies of archaeologists' use of these systems were found. Given the existence of these systems and their strong use within the domain, why there have been so few studies of archaeologists' information behaviors is unclear.[7]

Architects

Several publications on the information behaviors of architects discussed their image needs, although only a few of these have examined the image resources that were used. In a 1991 article, Joyce Chidlow discussed the typical types of information needed by architects to perform their work. Images are noted as being used at the start of architectural projects for inspiration and reference purposes, as well as in the design stage for peripheral art to complement the structure and create an overall environment.[8] Chidlow's findings were supported and built upon by Stephann Makri and Claire Warwick in their thorough study of the information behaviors of graduate architecture students

published in 2010.[9] These researchers found that the students used a large number of images and videos in the creation of their architectural designs, and that their primary means of discovery was Google or Google Images.[10] Furthermore, their study revealed the common behavior among the students of developing personal collections of images to assist them in their design processes.[11] Hinda Sklar also studied architecture and design students, and reported in 1995 that they look for images in a variety of resources that include "periodicals, books, videos, planning reports, maps, drawings, plans, and sketches."[12] Sklar states that an immense amount of material was used very rapidly by the students, and they were often seen working with the materials where they found them—copying, disassembling, reassembling, and reconstructing the images to work through design problems and stimulate their thinking.[13] Valerie Bradfield studied architects' use of image collections located within an academic setting in the United Kingdom and found a similar pattern of combining several images.[14] Bradfield also noted in this study published in 1976 that the architects had precise image needs, such as overlaying images of two building plans to discern differences in the design.[15]

Artists

In the literature published in the last thirty years that has examined artists' information behaviors, there are several recurrent findings surrounding their strong interest in finding visual information. All of the authors who have looked at this user group have acknowledged their need for images. However, existing studies have typically focused on individuals teaching in a college or university setting rather than on practicing artists. This lack of research attention on the needs of practicing artists was noted by William Hemmig in his thorough 2008 review of the information-behavior literature on artists[16] and in his 2009 study of their information-seeking practices, including sources of specific visual elements.[17]

Bradfield's 1976 study of institutional image collections found that artists were not heavy users of slides. Although Bradfield recorded that they would incorporate images into their lectures occasionally, artists generally used images in either planned or informal lectures to illustrate a simple point or technique.[18] For these needs, book illustrations were found to be as adequate an image format as slides. These findings were reiterated in the 1996 article by Susie Cobbledick, who found that artists' personal collections of materials, as well as those of public and institutional libraries, were consulted.[19] Jacquelyn Challener's 1999 master's thesis examined faculty artists' and art historians' information behaviors. She found that all of the artists in her study used a variety of image formats.[20] These included photocopies, reproductions from books and magazines, plaster casts, computer printouts, book plates, original works of art, and the classroom's blackboard for sketches and diagrams.[21] Hemmig's 2009 study also supports the artists' use of a wide variety of resources. He found that when artists sought inspiration, they did so through direct observations of nature, personal experiences, works of art seen in person, non-art man-made objects, images in analog form (books, magazines, photographs), moving imagery, music, the printed word, digital images, and radio, among others.[22]

Additional studies of the image resources of artists have been conducted in recent years. One of these is the 2006 report on a survey of nearly one hundred artist-participants conducted by three MLIS students at the University of Washington.[23] The findings from this survey corroborate many of the previously published studies on the topic, including the findings that suggest artists use visual materials more heavily than text-based resources and that they have well developed personal collections to support their needs.[24] Information collected by Tori Gregory through another survey of 165 art studio faculty members from universities in the southern and western United States provided detailed results concerning the specific resources that artists employ to find images.[25] This 2007 study reports that Google Images, used to access other Internet sites, was the primary means of image retrieval, with 67 percent of the faculty-respondents noting their use of it.[26] Various online image databases were employed by a smaller group of the faculty (16 percent of the respondents). Among these, the image database ARTstor accounted for 10 percent of the use, Wilson's Art Museum Image Database 4 percent, and another database such as MDID (Madison Digital Image Database) was employed by the remaining 2 percent.[27]

Art Historians

Art historian users are the most thoroughly researched group to be included in the present study. The vast majority of publications which mention image use among art historians have commented on their heavy need for visual materials. Bradfield notes that art historians were the most prevalent and heaviest users of images among the participants she studied in her 1976 publication.[28] Challener also found images to be of primary importance to the art historians she studied.[29] They visited the departmental slide collection, used their own personal collections, employed museum images, had slides made through the institution's audio-visual department, used textbook sets, and made their own slides or photographs in situ.

Christopher Bailey and Margaret Graham examined the availability of digitized images and how this may have influenced the discipline of art history. The findings of this preliminary report, presented at a 2000 conference,[30] suggested that working methods appear to have been affected only slightly. Digital images, along with all material found on the web, were seen to fall short of the reliability needed to support art historical investigation. The authors also discuss the use of image databases by art historians and suggest that the larger, broadly focused image databases do not receive the use they should because of the diverse approaches employed by art historians. Bailey and Graham revisited the data gathered for the original study in a later article published in 2006, and they state that the art historians noted several positive aspects of digital image use, along with several barriers to use.[31] A basic lack of knowledge about image resources among 58 percent of the respondents was noted as being the greatest problem.[32]

Trish Rose, in her 2002 examination of the use of technology by art historians, noted that most were still reliant on print resources for their work.[33] In the case of images, she suggested that their reluctance resulted from the overall poor quality (or lack) of digital images.[34] Her survey revealed that 33 percent believed a lack of image access was the greatest barrier they faced

in performing their research.[35] A 2007 study by Barbara Elam of the use of digital images also examined art historians' adoption of this format.[36] She interviewed six art historians about their use of online materials and found that they either did not use or were unimpressed by digital images. Elam connected this lack of adoption to two main factors: a lack of comfort with using technology and a lack of awareness of resources.

A Cross-Discipline Approach

A 2004 multi-discipline study conducted by Attig, Copeland and Pelikan investigated the importance of visual material to users on the campus of Pennsylvania State University (Penn State).[37] These researchers report that 44 percent of faculty and student respondents maintained personal collections of digital images for teaching and research. The researchers also noted that the users were concerned primarily with issues surrounding content as opposed to retrieval. They state that the users "are less concerned with *how* to discover images than with whether the image library will contain relevant images at all."[38]

The above studies help to inform our knowledge of image users' information behaviors. It was against this backdrop that the current study set out to examine professional image users' selection and use of image resources.

Current Study

Several research questions focusing on the image resources of these professional user groups were developed for the current study. These include:

- What image resources are used by these professionals in the performance of their work?
- Which image resources are preferred by these professionals?
- What impact, if any, does their discipline have on their selection of image resources?

Participants

A study of professional image users conducted in 2008-2009 by the first author of this article examined these questions. Twenty participants from four professional image user groups (archaeologist, architect, art historian, and artist) were recruited for the study. These user groups were selected based on their similarly strong reliance on images of cultural materials in their work. It was believed that selecting user groups employing similar visual materials in their work would help clarify any differences that might be discovered among the groups. Finally, practical considerations played a role in the selection of the four groups—the first author had easy access to individuals in three of the four chosen groups.

Beyond the user groups selected for study, the selection criteria for the participants were based on the particular career path chosen within their respective professions. As each of these professions has multiple possible career tracks, the selection was restricted by the kind of work performed by each of the user groups. The participants included in the archaeologist and art historian user groups were expected to be actively involved in teaching and research at the college or university level. These two groups shared a common foundation in the pedagogical and research-oriented work they performed. The participants included in the study of the architect and artist user groups also shared a similar professional goal. These participants were included if they were presently producing creative works (architecture or art). The architects were included in the study if they were working either in an architectural firm or self-employed and were paid to create architectural designs; the artists were expected to be practicing fine artists working in any media who self-identified as artists.

For inclusion in the study it was also expected that the artists were creating works that had a primarily aesthetic purpose rather than a functional one, and that these individuals were actively exhibiting their work. Of the four user groups included in the study, the artists were the only individuals who performed supplemental work to support themselves. While all of these

Table 1: Demographic Characteristics of Participants by User Group

No. in Group	Gender	Education	Years in Profession	Position	Area	Setting
Archaeologist User Group						
4	4F	PhD	15-40	Instructor, Asst. Professor & Professor	Etruscan, Greek, Roman, Hellenistic	Small College & Large University
Architect User Group						
6	3F 3M	BArch & MArch	4-40	Head of Graphic Design, Designer, Architect	Civic, Educational, Residential, Medical & Urban Renewal	Consultant, Small to Large Firm
Art Historian User Group						
4	4F	MA & PhD	15-41	Instructor & Professor	Ancient, Medieval, Renaissance, Contemporary	Small College & Large University
Artist User Group						
6	4F 2M	BFA & MFA	7-40	Multimedia, Painter, Printmaker, Sculptor, Mixed Media	Figurative & Abstract	Own Studio & Studio with Collaborative

individuals self-identified as artists, two of the six participants in this group performed some form of work which diverted a part of their time from their art-making. As this paid work did not interfere with their ability to produce works for exhibition, they were included in the study.

Recruitment of participants was completed using the so-called snowball or chain method.[39] Through this method colleagues known to the researcher acted as contacts for additional professionals. These potential participants were contacted by the researcher, and a series of basic questions were asked to determine if the individuals met the study's inclusion criteria. If the participants met the criteria and expressed a desire to continue participation in the study, a meeting was arranged between the two parties. After the requisite institutional review board documents concerning the study had been explained and signed, data collection began.

Data Collection and Analysis

Data for this study was collected from each participant through a paper survey (Appendix A) and a one-on-one semi-structured interview (Appendix B). The participants' survey responses and the interviews were transcribed using Microsoft Word. The image users' processes, behaviors, and opinions discussed in the surveys and interviews were analyzed using case-ordered displays (see below) and the constant comparative method through the qualitative research software NVivo.[40]

The survey and interview responses were imported into NVivo and examined for several kinds of content. The first method of analysis, case-ordered displays, consisted of culling all direct, fact-based responses to the researcher's questions. An example of this type of question-response would be one concerning the specific resources the participants noted as being their most often used source for images. The responses of all of the participants were then compared within their user group and across all of the study's user groups. The constant comparative method of data analysis was used to examine the thematic patterns that emerged from the participants' responses. An example of a theme would be a response where a participant noted his or her frustration in using particular image resources. Additional, repeated passes through the data revealed further themes and sub-themes. The emergent codes representing the themes were recorded, defined, and revised as the data was read and re-read.

Two checks were completed for this study to evaluate the reliability of the findings. These consisted of an inter-coder assessment and a member check. To ensure that the codes were reflective of the actual themes present in the data, eight coders were recruited to check twenty-five passages taken from the collected data. The coders were given a defined list of codes and asked to assign two codes, one at a broad level and one at a detailed level, to each of the twenty-five passages. The codes from each coder were collected, and the inter-coder agreements were then tallied. The broader thematic codes applied to the passages saw a 96 percent agreement rate across all coders and the researcher. The more focused codes achieved an agreement rate of 81 percent. These agreement rates among the coders and the researcher were sufficient according to Ole Holsti's reliability measure threshold of 80 percent.[41]

The member check consisted of sending a summary of the findings to participants in each of the four groups studied. The aim was to speak with one individual from each group to ensure that what was being reported was in fact an accurate reflection of these users' work with images. Telephone re-interviews were carried out, and the participants' comments on the summary were gathered. Participants' responses received during the member-check interview confirmed that the researcher had been able to capture users' experiences and working methods in the summary.[42] As the researcher had set out to provide an accurate description of the image users' thoughts, beliefs, and experiences, support of the findings by the participants was a critical component in ensuring the credibility of the study.

Findings

Presented below are the findings of the study related to the participants' selection of image resources. The study conducted by the first author reaffirmed some of the findings of previous research studies surrounding this topic, uncovered new information, and in some cases revealed changes in attitudes and behaviors. Of particular note are the findings on preferences for image resources among the professional users surveyed.

Participants' Ranking of Image Resources

Responses were gathered through the survey instrument about the various kinds of image resources used by the participants and their preferences. One survey question (What types of resources do you use to find images?) presented the participants with a list of possible choices of resources (books, analog image libraries,[43] image databases, personal collections and websites) as well as providing them the option to write in their own responses. They were asked to rank the resources using a Likert scale (1–most important to 5–least important) according to how important each resource was believed to be in the performance of their work. While the majority of individuals ranked one selection for each number, the instructions appear to have been unclear to several participants who applied the same number to multiple resources.

As can be seen in Table 2, several facets were examined through this survey question. These consisted of the preferred image format (digital or analog) and the level of use of personally owned, created, and/or experienced images. The overall findings point to a preference for digital resources among the professionals in the archaeologist, architect, and art historian user groups. The artists, however, preferred print and other analog resources. The artist user group was also found to prefer to use images from their personal collections. The responses of the architect user group, too, indicated that their own collections of images play an important role in the performance of their work.

Table 2: Type of Resource Preferred by User Group

	Digital		Analog				Personal		
	Image Databases	Websites	Collections/ Libraries	Books	Magazines	Museums	Own Collection of Images	Own Art/ Designs/ Sketches	Own Experience (Looking)
Archaeologist 1[44]	1	2	4	3					
Archaeologist 2	1	2	3	4					
Archaeologist 3	5	3	4	1			2		
Archaeologist 4	2	1	3	5			4		
Architect 1	2	1	3	5			4		
Architect 2	2	1	4	5			3	3	
Architect 3	5	1	4	3			2	2	
Architect 4	2	1	4	3					
Architect 5	4	1		3	2				
Architect 6	1	3	6	4			5	2	
Art Historian 1	2	1	5	4			3		
Art Historian 2	2	1	4	5			3		
Art Historian 3	1	2	5	4			3		
Art Historian 4	3	4	2	1			5		
Artist 1	3	1	4	2					
Artist 2	5	4	5	1		3	1	2	
Artist 3	6	5	3	2			1	4	4
Artist 4	6	3	4	1		5	2		
Artist 5	5	3	4	2			1		
Artist 6	1	1	5	5			1		
Ranked 1st	5	10	-	4	-	-	4	-	-
Ranked 2nd	6	3	1	3	1	-	3	3	-
Ranked 3rd	2	4	4	4	-	1	4	1	-
Ranked 4th	1	2	9	4	-	-	2	1	1
Ranked 5th	4	1	4	5	-	1	2	-	-
Ranked 6th	2	-	1	-	-	-	-	-	-
Number of responses	20	20	19	20	1	2	15	5	1

Digital Resources

Digital resources were found to figure prominently in the resources employed by a majority (fourteen of twenty) of the participants in the archaeologist (three of four), architect (six of six) and art historian (three of four) user groups. These resources were seen as far less important by the majority of participants in the artist group with only two (of six) participants ranking them highly.

Over half (eleven of twenty) of the respondents noted digital image databases as the most or second-most important resource for their image needs. They were seen as being important to nearly all members of the archaeologist (three of four), architect (four of six) and art historian (three of four) user groups. Discussions of the use of digital image databases by these user groups during the interviews centered on the availability of the content they needed. "I went to ARTstor first. . . . It is a good repository for the mainstream images that I would need for an introductory course." [Archaeologist 2, lines 86–88 of transcribed interview]

However digital image databases did not share a similarly high level of importance among the participants in the artist group. From the interview responses of the artists, the digital image databases were not believed to contain the content they sought to perform their work. "Mostly [I find images in] books from my personal library and also from the Internet. I never use stock catalogs. I don't like the language and I think it is pretty cliché. It just bothers me." [Artist 1, lines 164–66 of transcribed interview] Or they were able to find what they sought on the open web. "I find that for my own practice I am able to find what I need through public venues . . . I know how to use search engines well enough using Boolean terms and such that I can usually narrow down what I want pretty quickly. So I don't really need academic databases for images, although I use them for journals a lot." [Artist 1, lines 164-66 of transcribed interview]

One participant in the artist group ranked these highly, however. During the interview, this artist discussed how the subject matter she sought was easier to find in a database of digital images or on the open Web. "I primarily use Flickr. I probably won't use books . . . I usually just find that there are so many more on there than I would find in the books in one library." [Artist 6, lines 151–54 of transcribed interview]

Websites were seen to be an important resource by the majority (thirteen of twenty) of participants overall, and by the majority of participants in the archaeologist (three of four), architect (five of six), and art historian (three of four) user groups. While two artist-participants ranked websites as their most important resource for finding images, the remaining members (four of six) of this group found them less important for their image needs.

Analog Resources

Several kinds of analog materials appeared in the list of survey responses; these consisted of printed books and magazines, and analog collections of visual materials (photographs and photographic slides). Additional formats were noted through the participants' own written-in responses. Analog resources, while still holding a degree of importance to these user groups' image seeking, were seen as being only modestly important and so were ranked at third or below by the majority (eleven of twenty) of participants in the study. One exception to this was found among the artist group—book resources were scored highly by the majority (five of six) of participants. When the survey responses of the participants in all four user groups are examined, it is clear that analog collections of visual materials

(photographs and photographic slides) were not believed to be a highly important resource to their work. A single participant (Art Historian 4) ranked these in second place in importance with the majority of participants (fourteen of nineteen) placing analog collections in fourth place or below.

The usefulness of books for the participants' image needs saw an even distribution in the way they were ranked in terms of importance. There appear to be personal preferences at work among the responses of the various participants since the rankings could range from one to five within a single group. However, when the votes are examined by group, it is clear that the strongest preference for books was found among the artists. The majority of artist-participants (five of six) ranked books as their most important or second-most important resource in their image-seeking efforts.

The artists' comments during the interviews regarding the image format they used in their work offer some insight into their preferences. One artist mentioned how she found analog images to be more conducive to her working methods than digital images. "[I]f it's in a book or if it's a photograph, it's easier for me to work from." [Artist 3, lines 1578–79 of transcribed interview]

Frustration with retrieving images via the computer was also noted as having a negative impact on seeking visual information online. The amount of time spent online searching for digital images was often seen as counter-productive. "Like, I give you a name, I give you a date, I give you the city...aah! If I ask for a city in Pennsylvania and specific guy, I don't need to know about some guy in San Francisco. I don't even know about some guy in Texas whose name might only be one of the two names. Are you kidding me? What, do I got nothing to do with my time? Sitting here twiddling through and scroll through ten thousand...aah!" [Artist 1, lines 1319–24 of transcribed interview]

The architect-participants, too, were cohesive in their opinion of books. However, in the case of the architects, books were ranked uniformly lower than was the case with the artists. Each architect's (six of six) ranking of them fell in the third place or below. Interestingly, the architects stated that seeking out images online would be less time consuming, and that the use of digital images benefitted their work processes. "I love the idea that I can go to Google Earth and figure out everything that I need to see. Then pre-plan where I am going to take photographs, or send somebody else to take the photographs. That saves me the time and energy." [Architect 3, lines 446–49 of transcribed interview]

Related to books, in that they are printed matter, was the written-in response regarding magazines given by Architect 5 and ranked as his second-most important resource. Although the responses to the survey question do not record this, the use of magazines among the participants in the architect group was strong, with the majority (five of six) noting during the interviews how magazine images played a role in their work. "Whether it's a design magazine or it's a book on architecture or it's a book on whatever it is . . . historical. It can be a variety of things. And then reading an article even in the newspaper or in a magazine will give me ideas, or you will see an advertisement for something like a tile company or a stone foundry. And so, that sends you off on tangents . . ." [Architect 1, lines 882–86 of transcribed interview]

The cause of the omission of magazines in their survey responses is unclear. It may be because this resource type was conceptually linked to books. Another reason for the omission may be that the wording of the survey question presupposes that the participant would be performing a direct search for an image as opposed to following general browsing behaviors. Through the interviews it was discovered that magazines were commonly used in the architects' casual information-gathering processes. The architects noted they would keep abreast of what was occurring in the field and make serendipitous discoveries when browsing magazines.

Personal Resources

A majority of the participants (fifteen of twenty) noted that their personal image collections were useful resources for their work. While the ranking of the importance of this resource was modest (ranked at third or below) among the participants in most user groups, nearly all (five of six) of the artists saw it as their most or second-most important resource. "I have this disease where I'm not allowed to throw a magazine away once I buy it. I don't have enough space for them. So, now I will get a whole stack of them and I will sit and I'll just go through the pages and whatever I see that stimulates whatever—I will just pull that out, and I will get a whole stack of those. And then I will cut out the thing that I wanted and then I will get like a big sketch book and I'll arrange the shapes. They sort of relate to one another. Not a collage, because I'm really keeping track of the shapes, what they are, so I don't layer anything. But, they will sort of be classified visually." [Artist 3, lines 898–904 of transcribed interview]

The effort involved in creating an organized sketchbook of images suggests that the images in this artist's personal collection are critically important. Related to the use of personal image collections is the importance of images created by the participants. Five participants (of twenty) noted the importance of these resources through written-in responses. "I take my sketchbook to my studio and draw from my sketchbook. I also started to make [lithograph] plates from my sketchbook so then I print on my drawing . . . I photocopy my sketchbook and then I turn them into plates and then I print on paper." [Artist 3, lines 898–904 of transcribed interview] While personally created imagery was ranked as an important resource by several of the architect and the artist participants in the study, none of the academic image users noted the use of their visual creations.

One last resource, a single written-in survey response of "observational," meaning first-hand visual experience, was mentioned by a sole participant (Artist 3) in the study. The importance of visual information in the world around the participant, although not recorded here in the survey's responses, was mentioned during the interviews by a number of the architects (four of six) and artists (five of six). "I am always looking at stuff. I am always cataloging. What comes to mind . . . is . . . whenever I am walking around or wherever I am, I am always taking note of my environment around me. It is just . . . .that is the language I work in." [Architect 2, lines 372–74 of transcribed interview] Because of this discovery it is likely that direct personal engagement with visual stimulus in their daily lives plays an important role in what each of these two user groups perceive as image seeking.[45]

The development of personal collections was found to be a coping mechanism resulting from the frustration the professional image users experienced in association with their image needs.

The theme of frustration was discovered during the interviews of the study's participants, and several causes of frustration were found: barriers to access, barriers to availability, difficulties due to the amount of time and effort needed to meet needs, financial issues, and technological obstacles. The most common way that these user groups tried to overcome these challenges was to create their own collection of personal materials. In fact, three-quarters of the participants had developed personal collections of materials in order to bypass the challenges they faced when trying to find images. The academic users noted they did this through finding images online in the open web, by purchasing commercially available images, and by photographing works themselves during their travels. "I add images that I've taken in museums . . . that I've taken while I've traveled, [and] that I've collected over the years." [Art Historian 4, lines 444–47 of transcribed interview]

Scanning images found in printed publications was another method mentioned for dealing with a lack of suitable image resources. "They are not there, and so I do have to go to books at that point, and I also make sure that I get a lot of books when I'm traveling around. Especially ones with nice color pictures." [Archaeologist 4, lines 284–86 of transcribed interview]

The architect-participants too developed several ways to cope with the lack of image resources in their workplaces. One method was the use of their own personal materials or resources belonging to their colleagues. "A lot of people in the office they have books at their desk and so they would say 'Do you want to look at that architect?' Oh, of course!" [Architect 6, lines 330–31 of transcribed interview] Collecting images of designs they found interesting, often unrelated to the current projects on which they were working, was another common activity mentioned as a way to alleviate the problems caused by a lack of useful resources. "We're building a library, in effect, in the hopes that these things are just on file." [Architect 3, lines 1140–41 of transcribed interview]

The artist-participants, too, noted their attempts to cope with a lack of access to resources through the development of their own personal collections. All of the artists discussed having a personal collection of resource material at their disposal. Some of the artists noted their own personal collection was richer for their needs than those available to them through their local public libraries. "In a lot of ways for my specific interests it [his book collection] is better than my regional library. If I want to branch out into things I don't really look at that often, then I'll go to the Smith County Library" [fictitious library name]. [Artist 2, lines 315–17 of transcribed interview] To access resources not in their personal collections, factors such as distance, time, and effort were weighed against the need for the image(s).

Participants' Favorite Image Resources

In order to discover which resources were preferred, the participants were asked to provide a written response naming their favorite resource (If you had to name one specific image resource as your favorite, what would it be?).[46] As can be seen in Table 3, the responses of the participants were varied, ranging from digital image databases, search engines, websites, and personal images to printed materials such as books and magazines. Nevertheless, several interesting patterns were found.

Table 3: Favorite Image Resource by User Group

	Digital						Analog	Personal	
	Google Images	Commercial Images	ARTstor	Websites	Google[47]	MDID	Books and Magazines	Own Collection of Images	Own Experience (Looking)
Archaeologist	T	-	2	R	-	T	1	-	-
Architect	3	3	-	-	1	-	1	-	1
Art Historian	4	-	-	-	-	-	-	-	-
Artist	1	-	-	1	-	-	3	1	
NUMBER	9	3	2	2	1	1	5	1	1

T (for teaching); R (for research)

The results support the finding that there was a preference for digital resources among the majority of participants in the archaeologist (three of four), architect (five of six), and art historian groups (four of four). The preference for commercial (ARTstor,[48] Dreamstime, Viewport, Archivision) and in-house developed (MDID) digital image databases was found only among the archaeologist (three of four) and architect (three of six) user groups.[49] ARTstor is included as a unique entry in Table 3 since it was noted by more than one participant. The other commercial digital databases mentioned by the participants were all unique instances given by a single individual. Somewhat surprising was the finding that none of the art historian-participants identified digital databases as their favorite resource. The reason behind this finding is unclear and warrants additional research.

Instead of a digital image database, all of the participants (four of four) in the art historian group were unanimous in their selection of Google Images as their favorite resource. This brings up a key issue that needs to be emphasized here: half of the participants named a search engine as their favorite resource. It is clear from the art historians' selection of Google Images as their favorite resource that, while they were keen on using online resources, there was no single outstanding resource they could identify to meet their image needs. Google or Google Images was also noted as being the favorite resource among the majority (four of six) of the architect-participants. From these findings it is apparent that the majority of users within these three groups are searching for images online through digital image databases and/or search engines.

Showing the opposite trend—a preference for analog resources—were the survey responses of the majority of the artist-participants (four of six). While two individuals in this group identified online resources (Google Images and Flickr, respectively) as their favorite, the remaining artists noted their preference for printed materials (books, magazines, and personal photographs). Two individuals in the study, both from the creative user groups, noted that their favorite resource was personal images.[50]

Discussion of Findings

The findings related to the image resources consulted by the professional user groups in this study add to the knowledge of where individuals seek out visual information. Beyond adding to the limited research surrounding image users' image resources, the present study's findings sometimes offer a competing vision of where these users find their visual information. The following discussion focuses on the findings of the current study and how these compare to the results of past research efforts. The first aspect to be discussed is the users' preferences in terms of image format, followed by an examination of the personal image collections developed by the users.

The resource preferences among the participants revealed that the majority of the participants in the archaeologist, architect, and art historian groups noted their preference for online image databases and/or digital images found through websites. Comparisons of these findings with earlier studies are difficult because the archaeologists' and architects' image behaviors and use of technology have received limited attention. The existing literature addressing archaeologists' information behaviors presents a conflicting picture. One body of literature illustrates that the discipline of archaeology has embraced technological tools,[51] and yet when academic archaeologists' information behaviors have been examined it appears that at least for textual information they continue to favor printed analog materials.[52] While the study by Huvila examines and supports the strong use of images by academic archaeologists, it remains frustratingly silent on the resources they employed to find visual materials.

Several studies have been published on architects' information behaviors.[53] However, as the majority of these were completed a number of years ago, discussions are generally limited to analog materials. They therefore offer few comparisons to the current study's findings for the architects' preference for online image resources. Ame Elliott's 2002 study of architects' use of images suggests that this user group had not yet embraced digital images or web-based image searching.[54] The current study found that architects' working methods were heavily dependent on digital images, the web, and computer technologies. These findings indicate that a marked shift in the working processes of the profession have occurred in the intervening years between the studies. Makri and Warwick's recent research into the information behaviors of graduate architecture students offers support for the current study's findings concerning the importance of visual materials to architects.[55] These researchers found that Google and Google Images were the chief entry point to finding visual content by the students, and that the development of personal collections of images was widespread.[56]

The use of digital images by art historians has been relatively well examined in recent years, but these studies offer a contrasting view to the present study's findings. Bailey and Graham examined art historians' use of digital images in their 2000 study and found these users had negative connotations associated with items found on the web.[57] At that time they found that art historians believed materials found on the web lacked authority. These researchers also report a lack of interest in using digital image databases among the art historians they surveyed.[58] Rose's 2002 study presented similar findings, with the majority of her art historian respondents noting a lack of in-depth scholarly resources and a lack of useful images.[59] A more recent study by Elam also suggests that art historians have not fully embraced digital images in their work practices. In her study of six art historians Elam notes that their lack of digital image adoption was the result of a lack of comfort with technology and limited awareness of resources.[60] However, the art historians in the current study looked more favorably upon the use of digital images. The reason for the divergent findings with prior studies and the current study is unclear. It may be that the present study was conducted after a watershed moment in the art historians' acceptance and adoption of digital images.[61] It is also possible that the several art historians interviewed for the current study all had an unusually high level of comfort working with technology. This finding in the current study is an inconsistency that necessitates additional research for clarification.

The findings associated with the artist user group in the current study presents an entirely different picture than that of the other three user groups. Although two artist-participants noted that digital image databases and/or websites were important to their image seeking, there was a marked preference for print resources among the majority of the artists.[62] The artist group also preferred using images from their personal collections. These two findings concerning artists' heavy use of print materials and their own personal libraries is supported by the study of artists' information-seeking behaviors reported by Cobbledick.[63] However, conflicting findings about artists' preference for online versus print resources have been reported in recent studies. Gregory found that 67 percent of the artist-respondents noted they accessed images through Google Images or other Internet sites.[64] Visick et al. also found there was a strong preference for, and use of, online resources among the artists they examined.[65] These two recent studies seem to suggest a trend toward the increased use of online resources among artists. It is interesting that the current study's findings do not corroborate the studies of Gregory or Visick et al. A possible cause for the variation in the studies' findings may be the result of the different data collection methods used to examine artists' information behaviors, or it may be that the current study contained a group whose image resources were markedly analog-oriented when compared to their peers. The cause of the variation in the findings requires additional research for clarification purposes.

Personally developed image collections were found to play an important role in the work-related image behaviors of all four of the study's user groups, with three-quarters of the participants noting their use. Previous studies to examine image users suggest this is a common practice. Attig, Copeland, and Pelikan's survey of the academic user community on Penn State's campuses found that 44 percent of faculty and student respondents maintained personal collections of digital images.[66] As has been mentioned previously, information regarding the image practices of academic archaeologists and practicing architects is limited. Supporting evidence in the literature for the personal image collection practices of archaeologists is absent. However, in the case of architects, Elliott found in her study that they all had their own personal collection of images, and that these could contain several hundred images.[67] A number of studies of art historians and artists corroborate the present study's findings regarding the use of personal collections. Challener's study of art historians reported that they used their personal collections of materials and made their own slides or photographs.[68] Elam

also found personally developed image collections among art historians. She observed that one academic art historian in her study was hesitant to move into the digital realm because she had developed a sizable personal slide collection over the course of her thirty-five-year career.[69]

Personal collections of resources were found to be the most heavily used by the artist-participants. This finding is supported by Cobbledick, who noted in her study that personal collections of materials were maintained and consulted by the artists.[70] More recent studies by Visick et al. and Hemmig also found that artists have developed personal collections supporting their needs.[71] The collections created by individuals were noted as being critical to the work processes of several architects (two of six) and one artist (one of six) in the present study. Hemmig's study also found that "images generated directly from your imagination" are a major source of visual information for working artists, although he does not suggest that these images be fixed in any medium.[72] Visick et al. also mention the artists' use of personally created images.[73] Additional discussions of these images were not discovered in the literature addressing the artists' or the architects' information behaviors.

Conclusions and Future Research

The most critical challenges facing the image users in this study were the inadequate availability of, and access to, appropriate visual content to meet their needs. Codified collection development practices similar to those for print collections do not exist for visual materials, so there is no standard against which to judge the holdings of an institution or a database. Because of the limited attention paid to providing image users with adequate content in both subject matter and in quality,[74] they were found to use print publications to meet many of their needs. This was the case even though the majority of the study's participants preferred using online resources. An even clearer indication of the critical need for additional image content is the finding that three-quarters of the participants in the study were actively developing their own collections to avoid future problems with image availability.

There are several ways that information professionals could assist these image users. The first of these involves helping image users create, manage, and preserve their personal image collections. The majority of the participants in the study felt their technological skills were inadequate to the tasks associated with the development and maintenance of their image collections. These image users would benefit from clear instructions about the various technologies associated with digital images. This includes information written in lay terms for the hardware and software used for image processes, useful methods of image file manipulation, and image file naming. These users would also benefit from instructions and assistance in archiving their image files. Several participants in the study were not performing any form of digital image archiving for the personal images they had created and accumulated. Finally, information professionals need to help users manage their personal images for later retrieval. These aspects were found to be particularly pressing to the creative users since their image files were rarely saved in a way that allowed them to be easily retrieved. As personal image collections grow in size, the development of users' skills for finding the images they seek becomes more of a challenge.

Related to their personal collection building efforts is the realization among the participants that they were probably replicating the work of others in their image processing and management efforts. The users in the academic groups stated that they would welcome the opportunity to contribute to and use a large image collection shared across many institutions. It is not inconceivable to think of an online database of images that could take advantage of the knowledge, images, and expertise of professionals who work with images and do it in an easy-to-use and low- or no-cost way. Since users in this study have experienced difficulties trying to find and archive their own digital images, there is an added incentive for them to upload their images to an online site that could provide both organizational and archival support. While some creative individuals will have concerns about intellectual property rights when sharing their images, methods can be developed to limit access to their images in order to protect these from misuse. Given the currently available technologies, the popularity of photo-sharing services such as Panoramio and Flickr, and the participants' broad use of the Internet, it would be possible to assist these users in managing their personal images in an online setting. Online systems have the added advantage of allowing content users to apply terms and descriptions to images. Whether the user-supplied information is available to others or only to the individual user who has uploaded the image, its strength is in the supplemental level of access provided to the visual information. Since access to images was noted as being a challenge for most participants in the study, efforts toward improving image retrieval in the online setting for professional image users presumably would be welcomed.

The finding of limited use of online digital image databases by the image users in the study prompts additional research into the cause(s). Several users suggested that these information systems did not yet contain the depth and breadth of content they needed. This situation could also be indicative of additional issues, such as the users' limited technological abilities, financial barriers, and/or their lack of knowledge about available databases. The usability of the available image databases also may contribute to their limited adoption since they may not be well-suited to the users' technological skills. As many users expressed a belief that their technological skills were limited, it is a factor that warrants future research. Financial barriers were also associated with the limited use of image databases by several users, and potential users were not particularly well-informed about the range of image databases available to them. From these findings it is clear that image database providers need to show image users a professional level of service through a consistently high level of image quality, expertly applied descriptive information, and content depth and breadth that meets users' needs. Furthermore, they must provide system features that cater to the technological skill level of their users and do a better job of educating users about the content of the databases. If digital image database providers achieve these goals, it is likely they will see increased use among professional image users.

The fact that artists were found to prefer the use of print resources is an intriguing discovery that should also be examined more closely. From the findings of the present study it appears that the artists prefer print materials since this format is better suited to their work processes. However, there were artists in the study who used computers to find and work with images, and

these users varied in their overall preference for images in print. At a minimum, an investigation of this topic would identify the most useful format of information delivery for these users.

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Notes

1. The first author began the literature review for this study by examining the literature published from 1995 onward. However, it was discovered that the literature addressing the image users under investigation in this study was limited. As a result of this situation the time period restriction was lifted, and all items offering information about the information behaviors of the study's user groups were considered.

2. Isto Huvila, "Analytic Information Horizon Maps," *Library and Information Science Research* 31, no. 1 (January 2009): 18–28; Isto Huvila, "The Information Condition: Information Use by Archaeologists in Labour, Work and Action," *Information Research* 13, no. 4 (December 2008), http://informationr.net/ir/13-4/paper369.html. Huvila's 2008 paper, although it presents some of the data collected from interviews with twenty-five Nordic archaeologists, is not an analysis of the archaeologist's information behaviors. Instead the paper shows how Hannah Arendt's theory of *vita activa*, which divides human activity into labor, work, and action, could be applied to information-behavior research. The paper discusses how this tripartite model could be used to analyze the interview transcripts, but it does not address the content of the interviews.

3. Huvila, "Analytic Information Horizon Maps," 21–23, 26.

4. Jeffrey T. Clark, Brian M. Slator, William Perrizo, James E. Landrum, III, Richard Frovarp, Aaron Bergstrom, Sanjay Ramaswamy, and William Jockheck, "Digital Archive Network for Anthropology," *Journal of Digital Information* 2, no. 4 (2002), http://journals.tdl.org/jodi/article/view/50/53.

5. Gary Marchionini, "Evaluating Digital Libraries: A Longitudinal and Multifaceted View," *Library Trends* 49, no. 2 (Fall 2000): 304–33.

6. Gregory H. Bearman and Sheila I. Spiro, "Archaeological Applications of Advanced Imaging Techniques," *The Biblical Archaeologist* 59, no. 1 (March 1996): 56–66.

7. The heavy use of image collections to support the teaching and research of academic archaeologists is confirmed by the first author's firsthand experience working in image collections. However, formal studies of archaeologists' information behaviors surrounding visual material are frustratingly limited.

8. Joyce Chidlow, "The Information Needs of Architectural Practices," *Art Libraries Journal* 16, no. 3 (1991): 18–24.

9. Stephann Makri and Claire Warwick, "Information for Inspiration: Understanding Architects' Information Seeking and Use Behaviors to Inform Design," *Journal of the American Society for Information Science & Technology* 61, no. 9 (September 2010): 1745–70.

10. Ibid., 1752–53, 1755–56, 1765.

11. Ibid., 1763.

12. Hinda F. Sklar, "Why Make Images Available Online: User Perspectives," in *RLG Digital Image Access Project*, ed. Patricia McClung (Mountain View, CA: Research Libraries Group, 1995), 13.

13. Ibid.

14. Valerie J. Bradfield, *Slide Collections: A User Requirements Survey*, British Library Research & Development Report 5309 (Leicester, UK: Leicester Polytechnic, 1976), 46.

15. Ibid.

16. William S. Hemmig, "The Information-Seeking Behavior of Visual Artists: A Literature Review," *Journal of Documentation* 64, no. 3 (2008): 343–62.

17. William Hemmig, "An Empirical Study of the Information-Seeking Behavior of Practicing Visual Artists," *Journal of Documentation* 65, no. 4 (2009): 682–703.

18. Bradfield, *Slide Collections*, 44.

19. Susie Cobbledick, "The Information-Seeking Behaviors of Artists: Exploratory Interviews," *The Library Quarterly* 66, no. 4 (October 1996): 357–59, 360.

20. Jacquelyn Challener, "Information-Seeking Behavior of Professors of Art History and Studio Art" (master's thesis, Kent State University, 1999), 33–35.

21. Ibid., 35.

22. Hemmig, "An Empirical Study of the Information-Seeking Behavior of Practicing Visual Artists," 687–89.

23. Richard Visick, Judy Hendrickson, and Carolyn Bowman, *Seeking Information During the Creative Process—A Pilot Study of Artists*, 2006, 21–22, 26, 34, accessed August 31, 2009, http://staff.washington.edu/jath/portfolio/570final.pdf (site discontinued).

24. Ibid.

25. Tori Gregory, "Under-Served or Under-Surveyed: The Information Needs of Studio Art Faculty in the Southwestern United States," *Art Documentation* 26, no. 2 (Fall 2007): 57–66.

26. Ibid., 63.

27. Ibid.

28. Bradfield, *Slide Collections*, 44.

29. Challener, "Information-Seeking Behavior of Professors of Art History and Studio Art," 33–35, 63.

30. Christopher Bailey and Margaret E. Graham, "Compare and Contrast: Measuring the Impact of Digital Imaging on the Discipline of Art History," *Thirtieth International Congress of the History of Art: Art History for the Millennium: Time, 3-8 September 2000, London*, http://www.unites.uqam.ca/AHWA/Meetings/2000.CIHA/Bailey.html.

31. Margaret E. Graham and Christopher Bailey, "Digital Images and Art Historians—Compare and Contrast Revisited," *Art Libraries Journal* 31, no. 3 (2006): 21–24.

32. Ibid., 23.

33. Trish Rose, "Technology's Impact on the Information-Seeking Behavior of Art Historians," *Art Documentation* 21, no. 2 (Fall 2002): 37.

34. Ibid., 38–39.

35. Ibid., 39.

→ Barbara Elam, "Readiness or Avoidance: E-resources and the Art Historian," *Collection Building* 26, no. 1 (2007): 4–6.

37. In this study the authors focused on users in the arts, humanities, and environmental sciences with the goal of establishing guidelines appropriate for a multi-disciplinary resource. John Attig, Ann Copeland, and Michael Pelikan, "Context and Meaning: The Challenges of Metadata for a Digital Image Library within the University," *College & Research Libraries* 65, no. 3 (2004): 251–61.

38. Ibid., 253.

39. W. Paul Vogt, *Dictionary of Statistics and Methodology: A Nontechnical Guide for the Social Sciences* (Thousand Oaks, CA: Sage, 1999), 268; Michael Quinn Patton, *Qualitative Research and Evaluation Methods* (Thousand Oaks, CA: Sage Publications, 2002), 237-38.

40. QSR International, "Nvivo 9," http://www.qsrinternational.com/products_nvivo.aspx.

41. Ole R. Holsti, *Content Analysis for the Social Sciences and Humanities* (Reading, MA: Addison Wesley, 1969).

42. Archaeologist 3, Architect 6, Art Historian 4, and Artist 6 were the participants who took part in the member check.

43. In the context of this study, analog resources mean tangible media (photographs, photographic slides, books, and magazines) or actual works (paintings, buildings, and sculptures).

44. The participants in the study are identified according to their group membership and by a number indicating the order in which they were studied. Thus, Archaeologist 1 was the first participant to partake in the study from the archaeologist user group, Architect 3 would be the third participant from the architect user group, and so on.

45.The number of participants to rank this resource as important to their image seeking could in fact be higher had it been included in the list of options for the survey question.

46. The term favorite in this survey question implied the most useful and frequently used resource by the participants. In some cases the participant identified several "favorites." Dual answers were based on what the image was used for in the case of the response of Archaeologist 4, or whether or not the participant was able to find what was needed in a particular commercial image database (Architect 3 and Architect 6).

47. One of the architects noted he used the general search engine Google rather than performing a search with Google Images since he would discover images and additional information useful to the development of the design.

48. Since use of resources is tied to availability, it should be noted here that all of the academic users had institutional access to ARTstor.

49. For more information about the image databases discussed by the participants see: ARTstor, http://www.artstor.org/index.shtml; Dreamstime, http://www.dreamstime.com/; Archivision, http://www.archivision.com/; and MDID, http://sites.jmu.edu/mdidhelp/.

50. Artist 3 noted her own photographs as her favorite resource. Architect 2 noted that the experience of looking at the world around her was her preferred resource.

51. Clark et al., "Digital Archive Network for Anthropology"; Marchionini, "Evaluating Digital Libraries"; Bearman and Spiro, "Archaeological Applications of Advanced Imaging Techniques."

52. Huvila, "Analytic Information Horizon Maps," 20–22.

53. Makri and Warwick, "Information for Inspiration"; Ame Elliott, "Computational Support for Sketching and Image Browsing During the Early Phase of Architectural Design" (PhD diss., University of California, Berkeley, 2002), http://people.ischool.berkeley.edu/~ame/dissertation/PDFs/downloads.html; Sklar, "Why Make Images Available Online"; Chidlow, "The Information Needs of Architectural Practices"; Bradfield, *Slide Collections.*

54. Elliott, "Computational Support for Sketching and Image Browsing During the Early Phase of Architectural Design," 174–77.

55. Makri and Warwick, "Information for Inspiration."

56. Ibid., 1752–53, 1763.

57. Bailey and Graham, "Compare and Contrast."

58. Ibid.

59. Rose, "Technology's Impact on the Information-Seeking Behavior of Art Historians," 38–39.

60. Elam, "Readiness or Avoidance," 5.

61. The adoption of digital image technology appears to have been precipitated by a confluence of several forces in a short period of time in the early to mid 2000s. During this period the Eastman Kodak Company stopped manufacturing professional 35mm slide film (the first type was discontinued in 2001) and slide projectors (2004), the cost of computer processors and memory began to fall (2001), ARTstor became available through subscription (2004), and Google Images was introduced (2001).

62. One artist (Artist 1), who ranked web sites as most important, chose books as the next most important resources for his image needs. This is understandable as he works primarily with images provided through news-related websites. The other artist to rank online resources highly used a computer to work with images in her hourly paid position.

63. Cobbledick, "The Information-Seeking Behaviors of Artists," 361–62.

64. Gregory, "Under-Served or Under-Surveyed," 63.

65. Visick et al., *Seeking Information During the Creative Process*, 25.

66. Attig, Copeland, and Pelikan, "Context and Meaning," 253.

67. Elliott, "Computational Support for Sketching and Image Browsing During the Early Phase of Architectural Design," 179–81.

68. Challener, "Information-Seeking Behavior of Professors of Art History and Studio Art," 33.

69. Elam, "Readiness or Avoidance," 5.

70. Cobbledick, "The Information-Seeking Behaviors of Artists."

71. Visick et al., *Seeking Information During the Creative Process*, 23; Hemmig, "An Empirical Study of the Information-Seeking Behavior of Practicing Visual Artists," 697, 700.

72. Hemmig, "An Empirical Study of the Information-Seeking Behavior of Practicing Visual Artists," 689.

73. Visick et al., *Seeking Information During the Creative Process*, 20.

74. See the recent study by McCann and Ravas concerning the impact image quality in online journals had on user experienc → Steve McCann and Tammy Ravas, "Impact of Image Quality in Online Art History Journals: A User Study," *Art Documentation* 29, no. 1 (Spring 2010): 41–48.

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APPENDIX A: Data Collection Instrument—Survey

1. With which group do you identify most closely? (Choose one.)

Archaeologist architect art historian artist

2. How many years have you been associated with this group you identify?

3. What work tasks do you complete with images?

4. What types of images do you usually find yourself needing? (For example, images of pottery, cornices, Degas's pastel drawings, etc.)

5. Approximately how often do you find yourself needing images? (Choose one.)

Daily Weekly Monthly Other (please specify)

6. If you had to name one specific image resource as your favorite, what would it be?

7. What types of resources do you use to find images? (Please rank in order of importance, using 1 as most frequently used to 5, least frequently used.)

Books
Image libraries (analog collections—slides, photographs, etc.)
Image database(s)
Personal collection
Website(s)
Other(s) (please specify)

8. Please describe briefly how you go about looking for images when you are using your favorite resource.

9. Once you have found the images that interest you, what do you typically do with them?

10. How do you incorporate images into your work?

11. Which tools and technologies do you use to work with your images?

APPENDIX B: Data Collection Instrument—Interview Guide

Greetings—Do this off tape. Give date and time at start of recording.

Ethnographic explanations—Several discussions about the project have taken place prior to the interview meeting. An in-depth and detailed account does not need to be given.

The following need to be re-stated:

Project explanations—The project focuses on the participant's image experiences and how images are found.

Question explanations—Do this alongside questions when warranted. State at outset the participant should feel free to discuss anything that parallels the general topic of the project.

Recording explanations—Mention that the study is confidential and that participant's identity will be protected.

Interview Questions

TRANSITION: I will begin by asking you some general questions about your work and your background. Then I will ask you a series of questions about why you need images and how you go about finding them. The study is trying to gain a better understanding of users of images, so you should feel free to discuss anything that comes to mind in response to the questions asked.

1. Can you tell me a little about your educational background?
2. Could you please tell me what type of work you perform and what your specific interests are in the field you work in?
3. Can you tell me a little bit about why you need and use images in your work?

TRANSITION: Think back to the last time you needed an image or images.

4. Could you please describe for me what you were working on when you needed the image or images? **PROBE (if not discussed)**: Can you talk about the task you were working on? Why did you need an image or images in this instance?
5. What image or images were you looking for the last time you needed to locate an image for something you were working on? About how long ago was this?
6. How did you go about finding what you were looking for (in other words, did you search for the image using a specific word or name, did you look for the image under a general heading, or ...)?

7. What resources did you use to find the image or images (did you use personal or library materials and were the images found in books, databases, photographic collections, or ...)?
8. Were you able to find what you were looking for? **PROMPT:** What about if there were a system available where you could search on things like color and shape? Do you think you might use this sort of system to find images?
9. If you think back to other times you have needed images, how typical was this image need? **PROBE (if it wasn't highly typical):** Can you give me examples of more typical situations?

TRANSITION: Now I will ask you some more general questions about how you go about finding images.

10. Where do you typically go to find your images and when does this occur? In other words, where do you look for images and do you generally do this as the need arises, on a set schedule, or so on?
11. How do you find an image of a work you know about? In other words, if you were looking for a work you knew of and you knew the title, date, name of the creator, media, or some combination of these, how would you generally try to find the image?
12. How would you find an image of a work that was unknown to you? In other words, if you were looking for a work you had seen or had been told existed, can you describe how you might find that image?
13. Now I would like you to think back to the last time you had difficulty finding an image, or were unable to find an image. Can you take me through the steps you went through in trying to find the image? What barriers prevented you from finding the image? Were you ultimately successful? Why or why not?
14. Can you walk me through how you typically select the images you use from the images you are able to find? **PROMPT**: For instance, do you look for images in color over black and white, aesthetic or historical views?
15. Can you list the technologies and formats you currently use for your image needs? In other words do you use 35mm slides, digital images, still photography and so on, and what systems are in place to support these? **PROMPT**: Are there others?

Are you saving your image files to CDs, flash drives, or external drives for an extra back-up? Do you back-up your image files? If you do, how?

Also, I was curious as to whether or not you might know of or use an electronic archive/repository on campus (or elsewhere) for your images? Do you see the images you have amassed as having enough value (however you want to define that) to warrant placement in an archive/repository?

16. Do the methods you employ to find images in these various formats different from one another? If they do, how and why?
17. Can you walk me though how you typically use images (in the classroom/in the studio)?
18. Does your use of images for your own research differ from the ways you might use them (in the classroom/in the studio)? If yes, how do you use images for that?
19. In your experience, are the currently available tools adequate for finding and using images? In your opinion, what would improve your ability to work with images?
20. Is there anything else you think I should know about your image needs, how you search for images, or your use of image for your work? Is there anything else you would like to discuss surrounding images?

Thanking and taking leave – Thank subject for participating and stop the tape.