Personal Research Collections: Examining Research Practices and User Needs in Art Historical Research

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I, Christina Kamposiori, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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ABSTRACT

This thesis examines the way that art historians build their personal information collections through focusing on how they gather, use and manage information in the context of their research and teaching projects. In recent years, the rapid technological advancements and the proliferation of digital resources have greatly affected the way scholars approach, create and manage information in the Arts and Humanities.

Regarding art historians, most studies so far have looked at their information seeking behaviour. Therefore, there is little information available on how researchers in this area handle the information after discovery. This is the first study exploring this aspect of scholarship in the field of art history; for this purpose, individual interviews with twenty art historians were conducted along with observation of their personal information collections in the physical and digital environment.

The results showed that certain areas in art history have still limited access to useful digital resources while there were certain factors- previously not thoroughly explored- influencing scholars' trust of resources, such as the design of a resource. The emerging types of information objects used for research and teaching in the field, such as born digital data, were also linked to needs noted throughout the scholarly workflow that have not been met yet. Moreover, the two-phase gathering behaviour of scholars suggested that art historians have different information needs at different stages of the research process; an important issue considering that previous research has looked at this practice more as part of the initial stages of research in the field. Finally, examining the information management behaviour of scholars led to the identification of the implications for resource design to effectively facilitate research and pedagogical practice in this area; flexible designs, intuitive and visual interaction with information as well as simple interfaces were some the main things scholars needed.

IMPACT STATEMENT

Accessing and collecting information for research and teaching purposes are practices followed by scholars across a variety of disciplines. In art history, the personal information collections scholars create tend to include the wide variety of information they manage to gather throughout their research and teaching careers while they are often built as a response to problems they face in terms of information access or unsatisfying quality of digital content and services.

However, although there have been many studies focusing on the way art historians look for material in the digital age, our knowledge about the practices that follow the discovery of information is limited. This thesis fills this gap in the academic literature and, through focusing on an under-explored area of scholarly behaviour in art history, enhances our knowledge of the practices that take place 'behind the scenes', at scholars' personal workspace. The results of this thesis, along with the recommendations for future research, will further scholarship in the area of information behaviour and scholarly practices in art historical discipline.

The implications for digital resource design and related suggestions included in this study will be of interest to information professionals internationally and can lead to the building of cost-effective and sustainable digital infrastructure to support scholarship in the area. Furthermore, by identifying here an existing need that some groups of art historians have for specific types of content that is not currently digitised or accessible, this research can have an impact on cultural institutions' (e.g. museums, libraries) digital strategies and enable them to save resources through conducting more targeted digitisation activities to produce digital material that meets their users' needs.

On the other hand, the user requirements drawn in this thesis for the creation and provision of digital tools and services that will assist scholars with the (re-)use of the ever-increasing amount of digital information they collect and create will facilitate the production and dissemination of art historical scholarship which can have an effect on society and culture. Finally, the findings around the information use and management practices of art historians as well as their training needs will be of interest to Higher Education institutions, especially in the UK, and can shape the research support agendas targeting academics and postgraduate research students in art history.

The types of impact described above will be achieved through the dissemination of the outputs of this thesis. Parts of the results of this study have already been presented at local and international conferences and meetings in the areas of Digital Humanities as well as Art History and Cultural Heritage and published as conference proceedings papers, journal papers and book chapters, some of which are open access. Finally, the work conducted in this thesis has formed the basis of seminar talks delivered to postgraduate research students and groups of professionals working in related research areas. Further dissemination activity is planned in the immediate future with a focus on the Library and Information Science and Digital Humanities communities, the principal scholarly audiences for this research.

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For my husband. For his continuous support and patience.

LIST OF APPENDICES

Appendix I, which includes the interview and observation data (anonymised), can be found in the accompanying CD-ROM which is attached to the rear cover of this thesis. Appendices II and III can be found after the bibliography, at the end of the thesis. The contents of the Appendices are:

Appendix I

It consists of a folder which includes the final version of transcript for each of the twenty interviews conducted for the purposes of this study as well as the images taken by the interviewer or sent by the participants in the context of the observation process (in the cases where observation took place).

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CHAPTER 1: INTRODUCTION

1.1 Introduction: definitions, goals, research questions

According to The Getty Research Institute's Arts & Architecture Thesaurus Online,[1] art history is the

> study of the visual arts within a historical framework, from prehistory to the present, including stylistic development, use of art in communication and decoration, and the aesthetic and intellectual value of art. It first became a dedicated field of study in the 19th century Western world.[2]

The above description has been widely employed as a working definition for the purposes of cataloguing and indexing art historical materials (e.g. by art libraries, art journals).[3] Theoretically, there are several definitions of art history and this has been partly due to the constantly changing ideas about what constitutes art, a matter which is subject to different interpretations when examined in different cultural contexts. According to D'Alleva (2006, pp. 11-15) the term art, as we understand it nowadays, emerged in the Renaissance; yet, since then, it has expanded to include anything (tangible or intangible, permanent or ephemeral) created by a person or a group of people and which 'is invested with social, political, spiritual and/or aesthetic value by the creator, user, viewer and/or patron' (D'Alleva 2006, p. 13). Similarly, the discipline has developed greatly since the 1970's; a growing realisation that the history of art is strongly linked to historical and social changes has led to the emergence of the 'new art history' which has a strong social focus (e.g. see Harris 2001).

Generally speaking, art history is regarded as one of the Arts and Humanities disciplines. The characteristics that art history shares with other Arts and Humanities and, sometimes, Social Sciences areas relate to their goals and values concerning the study of the human

[1] Art & Architecture Thesaurus Online, http://www.getty.edu/vow/AATFullDisplay?find=&logic=AND&note=&subjectid=300054233.
[2] Yet, the foundations of art history as a discipline were laid by Johann Joachim Winckelmann (1717-1768) in his 'History of the Art of Antiquity' (1764) (Hatt and Klonk 2006, pp. 21-22).
[3] Art & Architecture Thesaurus Online (About), http://www.getty.edu/research/tools/vocabularies/aat/about.html.

behaviour and environment.[4] Moreover, the theories and methods employed within the broader area of Arts and Humanities are of a similar nature (critical, historical and speculative)[5] and are often distinguished by the approaches followed in the Sciences (more empirical). Prown (1982, pp. 1, 11) has particularly commented on the similarities amongst art history, material culture studies and archaeology; the focus placed on objects to question issues around culture as well as the methods employed to describe and analyse objects are characteristics that these disciplines share.

Given, though, that art historians generally examine their objects of study within broader contexts (e.g. social, economic, cultural), they often use theories and methods from across the spectrum of the Arts and Humanities and Social Sciences disciplines (also see Beeman 1995, p. 94). Thus, according to Haynes (2008), art history has always been a discipline and interdiscipline; the different lens through which it approaches its materials is one of the characteristics that differentiate art history from other areas. Other issues that make art history distinctive are: the various places where art history is practised (e.g. academia, museums, galleries) and, accordingly, the different ways in which scholarship is communicated (e.g. academic literature, exhibitions, other public media) as well as its dependence on reproductive media to communicate knowledge (e.g. images of objects).

In the digital age, factors related to these characteristics have made the employment of digital technologies for research purposes by art historians especially challenging and have often been responsible for scholars' hesitant stance towards them (as noted by Rodríguez-Ortega 2013; Zorich 2012, pp. 19-22; Cuno 2012). These include the diversity of information objects- types and formats- and methods used; the different career stages of scholars and the various degrees of digital literacy; and the variety of difficulties usually faced by researchers when using digital material such as access problems, low image quality, copyright issues, cost (e.g. see Rose 2002, p. 40; Grindley 2006, p. 6; Durran 1997, pp. 2, 9-11; Zorich 2012, pp. 33-34).

Various studies have been conducted on the information behaviour and needs of scholars in art history over the last thirty years with most of them focusing on the information seeking practices of researchers in the field. A key issue deriving from these studies has been the

[4] According to the 4Humanities, definitions of the Arts and Humanities may vary based on different cultural and geographical contexts; however, the common focus and values of the different disciplines are generally communicated through most of these definitions (five definitions are mentioned as examples).
[5] Ibid.

importance of personal information collections for research and teaching (Bakewell, Beeman and Reese 1988, p. 19; Challener 1999, pp. 45-46; Elam 2007, p. 5; Beaudoin and Brady 2011, p. 31). Moreover, the fact that digital technologies have not met the organisational needs of art historians is an additional matter that is often encountered and is worth stressing here (Rose 2002, pp. 37-38; Beaudoin 2005, pp. 35-36).

Consequently, the unique challenges faced by art historians in the digital age due to the nature of research conducted in the area along with the fact that there is little research focusing on how scholars organise and manage information in the digital age (e.g. see Palmer, Teffeau and Pirmann 2009, p. 16) set the objectives of the current thesis. More specifically, the purpose of this study is to foster the understanding of how scholars in art history create, design, use and manage their personal research collections together with the criteria upon which their decisions for doing so are made. Managing and curating large amounts of digital or mixed data increasingly becomes a pressing issue for scholars; thus, facilitating related practices has the potential to foster re-discovery and re-use of the collected material in research and teaching. Also, this thesis seeks to identify how the activity of collection building is related to other research practices, such as writing or reading. The research questions of this study are:

- What types and formats of information do art historians collect for research and teaching purposes nowadays?
- How do they find and gather the material they need? What are the difficulties they meet?
- How do art historians organise and manage the information gathered as part of their personal research and teaching collections? What tools do they use and what challenges do they face?
- How do scholars in the field (re-)use information in the context of research and teaching? Is there an information sharing culture?
- What is the role of personal information collections in the scholarly workflow?

Finally, although the aim of this research was not to create a specific digital tool or service, the aspiration of the author was to contribute, with the results of this research and their dissemination, to the better understanding of core scholarly practices, such as information gathering and organisation, which can, in turn, have a positive effect on the building of efficient digital infrastructure tailored to the needs of researchers in the field of art history. The results of this study will be useful to other information professionals and institutions, such

as museums and libraries, interested in learning about the behaviour and needs of their users in the digital age and planning their activities accordingly.

1.2 Thematic Structure of Thesis

Chapter 2: Literature Review

The second chapter of this thesis reviews the literature examining the information behaviour of scholars in the Arts and Humanities with an emphasis on the first stages of research, such as information seeking and gathering. The profile of art historians as users, their information seeking behaviour and their habits with regards to information organisation and management are also addressed in detail. The studies presented in this chapter constitute part of the foundation upon which the arguments of this thesis are built.

Chapter 3: Methodology

The third chapter is concerned with the methodological approach taken regarding the collection and analysis of the data in this study. More specifically, this part focuses on the methods of interviewing and observation which were employed for gathering the research data. The process of coding and interpretation that took place during the analysis stage is also explained and discussed. Finally, the limitations of this research are stressed.

Chapter 4: Research and Teaching: Projects, Methods, Information

In this chapter we present the research data around the participants' research projects and teaching activity as well as the information objects they used as part of their practice. The findings and observations included in this part form the necessary background for better understanding participants' information seeking and management practices presented later on.

Chapter 5: Information Seeking Behaviour: Criteria, Places, Practices

This chapter focuses on the findings around participants' decision making process when choosing resources to use, the places they visit to find information as well as the ways through which they look for research and teaching material.

Chapter 6: Towards Building Personal Research Collections

The discussion in this part is concerned with the first stages of the building of personal research collections, such as the gathering of information. By presenting the findings regarding the preferences of participants in terms of the places where they work as well as their habits,

the aim is to provide the context for fully understanding the ways they gather and interact with information ‘behind the scenes’.

Chapter 7: Recording, Storing and Filing Information

This chapter looks at the recording, storing, filing and labelling habits of the art historians in this thesis and presents the core practices and media entailed in the building of personal collections, the challenges that scholars face as well as the needs they have.

Chapter 8: Managing and Using Personal Collections

The purpose of this chapter is to present and analyse the research data around the information organisation, use and management practices of art historians in this study as well as discuss the role of personal research collections in the scholarly workflow.

Chapter 9: Discussion

This chapter provides a summary of the key findings of the thesis while discussing them in more detail from the perspective of the existing literature in the field. The purpose is to position the current research amongst the other studies and clearly indicate the contribution it makes to the knowledge in this area of study.

Chapter 10: Future Research

This chapter focuses on methodological suggestions for the development of future work in areas identified through the results of this thesis.

Chapter 11: Thesis Conclusion

The final part of the thesis includes the conclusion based on the analysis of the data of this research.

CHAPTER 2: LITERATURE REVIEW

2.1 Information Behaviour and Scholarly Practices in the Arts and Humanities

The necessity to study the informational and methodological behaviour of scholars in the fields of the Arts and Humanities has been addressed by several studies. One of the most extensive studies in the Arts and Humanities over the last decades has been the *Getty End-User Online Searching Project*. The project was supported by The Getty Information Institute and the major part of the study was conducted over the years 1988-1990, with the results published in six reports (Bates, Wilde and Siegfried 1993; Siegfried, Bates and Wilde 1993; Bates 1994; Bates, Wilde and Siegfried 1995; Bates 1996a; Bates 1996b). The aim of the study was to examine the information seeking behaviour of scholars by studying the searches they made and the techniques and terminology used while searching through the DIALOG databases; the ultimate purpose was to highlight the unique needs this group of researchers had in the online environment. The project's results are still of great value for librarians and other information professionals.

During that time, Bates (1989) proposed a new model for searching in a digital environment, the *berrypicking* model. The main points of this model were that users' queries and needs continually evolve through reading the information encountered during the search process, while their information needs are not satisfied through 'one grand best retrieved set' but rather by 'bits and pieces' of information found along the way (Bates 1989, p. 421). Some years later, Unsworth (2000), introduced the concept of the scholarly primitives, arguing that there is some common, basic behaviour that can be identified across disciplines and, especially, in the Arts and Humanities. In particular, he listed the following primitives: *discovering*, *annotating*, *comparing*, *referring*, *sampling*, *illustrating*, and *representing* and used as examples various projects of that time. In 2001, Brockman et al. examined the way researchers in the Arts and Humanities work in the new information environment. More specifically, they examined the information behaviour of scholars during several research stages, such as *searching*, *reading*, *writing* and *networking*, and attempted to identify the needs that characterise scholarly work in the broader disciplinary area as well as the distinct needs of the separate disciplines it includes.

In 2002, Palmer and Neumann examined the needs of interdisciplinary scholars in the Arts and Humanities. More specifically, two extra activities were noted to occur during the process of this kind of research, *exploration* and *translation*, which complicated the whole research workflow. According to the authors 'interdisciplinary exploration and translation complicate the already intensive information gathering, reading, and writing processes inherent in the humanities' (Palmer and Neumann 2002, p. 107). Another interesting finding was that, despite being previously regarded as resistant to the use of digital technologies, Arts and Humanities scholars in this study were discovered to be more receptive to these technologies and open to new ideas (Palmer and Neumann 2002, p. 103).

In 2005, Buchanan et al. investigated the information seeking techniques academics and other scholars in the Arts and Humanities used when looking for resources in digital libraries; the results of their research showed the existing gap between the researchers' skills and the digital services they used for seeking information resources. Furthermore, Rimmer et al. (2006) reported on work done for the *User-Centred Interactive Search Project (UCIS)*. Their paper focused on the information behaviour and needs of scholars in both the print and digital environment. The outcome of this project was intended to be used for the development of appropriate digital resources that would facilitate the needs of scholars in the digital age. Following, in 2008, Rimmer et al. examined the behaviour of humanities scholars in the physical and digital environment, emphasising the relevant qualities of research in this broad disciplinary area.

The same year, Warwick et al. (2008b) published the results of the *Log Analysis of Internet Resources in the Arts and Humanities (LAIRAH)* study. Their goal was to examine the scholarly resources used by researchers in the digital age, both analogue and digital, through analysing their information seeking behaviour. They argued that this study, by using quantitative methodology could give a clearer picture of the resources used by scholars whereas it could be useful for the future development of information services. A year after, Palmer, Teffeau and Pirmann (2009), based on Unsworth's concept of scholarly primitives, studied the scholarly activities and primitives in a variety of different disciplines, including the Arts and Humanities. Thus, they suggested five core scholarly activities, each of them including two or more primitives, and four additional cross-cutting primitives which can take place during

more than one activity. The core activities are: *searching*, *collecting*, *reading*, *writing*, *collaborating*.[6]

Moreover, Benardou et al. (2010) in their paper, which reported on work conducted in the context of the European project *Preparing Dariah: Preparing for the construction of the Digital Research Infrastructure for the Arts and Humanities*, argued for the importance of developing a better understanding of the scholarly research process, in order to identify the requirements for providing scholars with appropriate tools and services. For that purpose, they also presented a conceptual model of the scholarly research process based on the results of their interviews conducted with researchers across Europe. After also completing the research for the *European Holocaust Research Infrastructure (EHRI)* project, they published their results where they further discussed this model and its suggested use for exploring the practices and methods employed by scholars amongst the various Arts and Humanities communities (Benardou, Constantopoulos and Dallas 2013).

In 2011, Bulger et al. published a report commissioned by the Research Information Network (RIN) on the ways humanities researchers find and use information and how the digital age has impacted on this aspect of their information behaviour. Kemman, Kleppe and Scagliola (2014), while examining the digital practices of humanities scholars in the Netherlands, discovered that Google Search was the most popular search engine for finding information amongst this group of researchers. Blanke and Hedges (2013), by bringing together the results of various e-humanities projects conducted at the Centre for e-Research at King's College London, aimed to identify the common practices and needs of traditional and digital humanists, with respect to infrastructure work. Thus, they suggested five scholarly primitives; *discovering*, *collecting*, *comparing*, *delivering*, and *collaborating*.

Finally, two of the most recent studies on the scholarly practices and needs of researchers close to our area of interest were conducted by Ithaka S+R and concerned the fields of history (Rutner and Schonfeld 2012) and art history (Long and Schonfeld 2014). In both studies, the aim was to document the constantly changing research practices of these groups of scholars in the information age and provide suggestions for the facilitation of the research process in the field. Consequently, their reports contained information about the various stages of the research process in history and art history, including details about the discovery and use

[6]For the full list of activities and primitives, along with the cross-cutting primitives, see the table in Palmer, Teffeau and Pirmann (2009, p. 9).

of resources, the research methodologies, the organisation and management of personal collections, the sharing of information, and collaboration and communication.

2.2 Modelling the Information Behaviour of Users

Over the last decades, there have been several studies seeking to understand the information behaviour of users, especially when it comes to the use of information systems, by creating conceptual models. To begin with, one of the key studies in the field was that of Ellis and his colleagues (Ellis 1989, 1993; Ellis, Cox and Hall 1993) who created a behavioural model based on empirical, qualitative research of the information seeking behaviour of scholars in the social and physical sciences. He presented the various behaviours involved in information seeking as features and not stages, but he did not provide a diagrammatic representation of the model based on his elaboration of them.

According to Ellis (1993, p. 482), these features are: *starting*, *chaining*, *browsing*, *differentiating*, *monitoring*, *extracting*, *verifying*, and *ending*. However, he argued that, even though the above features might interrelate or interact with each other, this '[…] will depend on the unique circumstances of the information-seeking activities of the person concerned at that particular point in time' (Ellis 1989, p. 178). A decade later, Meho and Tibbo (2003, pp. 581-582), after studying a group of social scientists, discovered similar characteristics in the information seeking behaviour of their participants with those that Ellis had found, but they added three more features: *accessing*, *networking* and *information managing*.

Dervin, in 1983, published her model of *Sense-Making* which included four constituent elements: *situation*, *gap*, *outcome*, and *bridge*. In more detail, based on the Sense-Making theory, there is an entwined relationship between how you look at a situation and what sense you make from it (Dervin 1998, p. 39). This theory also takes for granted that we live in a world of discontinuity and the central question is how people make sense of this discontinuity. According to Dervin 'the core construct of Sense-Making is the idea of the gap- how people define and bridge gaps in their everyday lives' (Dervin 2003a, p. 223).

In 1991, Kuhlthau presented her *Information Search Process (ISP)* model which, as was the case with Ellis, was empirically tested. According to Makri (2008, p. 20), Kuhlthau's model '[…] is based on constructivist theories of system-related skills development and fo-

cuses on the cognitive and affective aspects of information-seeking'. Kuhlthau's model (1991, pp. 366-368) consists of the following stages: *initiation*, *selection*, *exploration*, *formulation*, *collection*, and *presentation* (see Appendix III for the model and full description of these stages).

In 1981, Wilson developed a macro-model of the information seeking behaviour examining how information needs may arise and what kind of barriers may prevent successful information searching. He also constructed hypotheses of how external or internal factors may affect a person's information seeking behaviour; for example, those based on personal characteristics or a person's working environment. In 1996, Wilson revised his 1981 model based on research from various fields like information science, decision making, psychology, innovation, health communication and consumer research (Wilson 1999, p. 256). The major changes included: the term *intervening variables* replaced the term *barriers*; the information seeking behaviour was shown to include more types than before; and three new theories were introduced: the *stress/coping* theory, the *risk/reward* theory and the *social learning* theory.

Moreover, Wilson in 1999 noted that his previous model in 1981 was lacking specific elements since his hypotheses were more implicit than explicit. He also attempted to create a merged model representing Ellis's suggested features of information seeking behaviour and Kuhlthau's stage process model. He also suggested that 'Ellis's behavioural model is a set of activities within what Kuhlthau calls "collection" [...]' (Wilson 1999, p. 262). Wilson nested model (Figure 1) was general and applicable to various cases and, therefore, highly referenced by future studies; he argued that the information seeking and information searching research areas could be seen as nested fields (1999, pp. 262-263):

Figure 1. A nested model of the information seeking and information searching research areas (Wilson 1999, p. 263).

Lastly, additional models of information seeking behaviour and reviews of the ones already mentioned followed in the next years. It is worth mentioning Foster's (2004) non-linear model of interdisciplinary information seeking. More specifically, Foster argued that little attention has been given to interdisciplinarity as a concept of information seeking behaviour. Foster proposed that this type of information seeking includes the core processes of *Opening*, *Orientation* and *Consolidation* which '[…] take account of the interaction between the information seeker and his/her Cognitive Approach, and their Internal and External Contexts' (Foster 2004, p. 234). Moreover, Foster and Ford (2003) examined serendipity as an important component of users' information seeking behaviour while Marchionini (2006) noted that many people engage in *exploratory search* in order to learn and investigate, and suggested that better tools are needed to foster this activity.

In 2006, Nicholas et al. published the results of their large scale study on the information seeking behaviour of the virtual scholar, produced after employing deep log analysis (DLA) techniques to study the usage of two large digital journal libraries (Emerald Insight and Blackwell Synergy) by more than three million scholars. Rowley and Urquhart (2007) and Urquhart and Rowley (2007) published their projects' results which aimed at the establishment of a model concerning the factors that influenced students' behaviour with regards to the use of digital information resources to support their learning; these factors were found to be information resource design, information and learning technology infrastructure, availability

and constraints to access, policies and funding, and organizational leadership and culture. Finally, Case (2012),[7] in his book, provided a detailed picture of the abundance of work conducted on the information seeking and retrieval behaviour of users up to that time.

At this point, after presenting some of the most important models on the information behaviour and information seeking behaviour of users, it should be mentioned that the models that will serve as a framework for understanding art historians' information behaviour in this study are mainly that of Ellis (1993), along with the additional features presented by Meho and Tibbo (2003), and Kuhlthau (1991). Ellis's and Meho and Tibbo's models, in particular, will be useful for identifying the distinctive behaviour of art historians in terms of the way they look for information during the initial stages of their research. Additionally, Meho and Tibbo's *information managing* will be of particular importance when discussing the relevant behaviour of scholars during the building of personal collections.

Furthermore, Kuhlthau's model is of special interest to this study (thus, a full description is included in Appendix III) for two reasons: firstly, it includes collection in the last stages of the information seeking behaviour and secondly, it is concerned with the cognitive aspects of information seeking. Collecting in current research is considered an activity that naturally follows the discovery of information and it follows Palmer, Teffeau and Pirmann's (2009, pp. 16-19) definition of *collecting* as an activity with two primitives: *gathering* and *organising*. In fact, the gathering of resources is the first step for creating a personal collection, just after the discovery of information and the decision to collect it. Based on this premise, *gathering* resembles to a great extent Kuhlthau's *collection*, a fact which highlights the strong link between the information seeking and collecting behaviour of users. Thus, Kuhlthau's model will be of significance for exploring the affective aspects of the behaviour of art historians during the initial stages of collection building, an aspect of their information behaviour that has not been previously examined.

[7] Especially in part three of his book, chapter 6, pp. 133-162, he presented in detail the most important models of information behaviour and information seeking behaviour, such as Ellis's, Kuhlthau's and Wilson's.

2.3 User Behaviour, Information Objects and Information Seeking Practices in Art History

Concerning the field of art history, scholarly behaviour and researchers' needs is a subject that has been under examination for more than thirty years; though, even today, the needs of art historians seem insufficiently satisfied by digital technologies (as will be discussed later). Given that many of these studies do not take into account current technologies and, thus, can be considered outdated, there is a need to re-examine or explore further certain aspects of scholarly behaviour, such as the way art historians find and use information. This observation highlights the importance of this thesis which, by focusing on a topic little studied before, aims to facilitate our understanding of the effect of digital technologies on scholars' work in the field. In the following sub-sections the literature related to the profile of art historians as users and their information seeking behaviour will be presented; this will help the reader create a detailed picture of what constitutes the research material in the field, how it is acquired and what challenges scholars face at the stage before the creation of their personal collections.

2.3.1 Information Objects in Art History

From the foundation of the discipline, art history has developed a close relationship with art objects; art objects tend to play a key role in art historians' research even when they are not the central topic under examination. For instance, scholars researching on subjects such as artists' biographies, or subjects examining sociological, political or economic issues, but from an art historical point of view, will have at some point to deal with the relevant art objects (Brilliant 1988, pp. 120-123; Bakewell, Beeman and Reese 1988, pp. 7-11; Beeman 1995, p. 94). Stam (1984, p. 3), also, suggested that the way art historians approach the artworks during their study may vary depending on their institutional affiliation. More specifically, she proposed that academic art historians may be more interested in the examination of the historical background of an artwork, while scholars in museums in the physical aspects of the object.

Although art objects play a principal role in art historical research, information objects in the field are not confined to artworks. Instead, the information objects necessary for the art

historical inquiry consist of an array of resources which complement, substantiate or even, sometimes, replace the works of art. These have conventional and digital form and can be textual, visual and multimedia; mainly, they consist of the primary and secondary resources collected from libraries, archives and museums throughout the world (Brilliant 1988, p. 122).

Regarding the visual material necessary for art historical research and teaching is usually found in illustrated books, exhibition catalogues of museums and galleries, photographic archives, or other two-dimensional forms of representation, such as slides (especially 35mm transparencies) (e.g. see Bakewell, Beeman and Reese 1988, pp. 16-18; Reed 1992, p. 735; Challener 1999, pp. 28, 41-43). However, even though visual resources are essential for research in art history, archival material is of vital importance as well. More specifically, it is necessary for the documentation of the art object and the construction of the relevant arguments (e.g. see Bakewell, Beeman and Reese 1988, pp. 22-23; Beeman 1995, p. 96; Anagnostou 2009, pp. 74-76).

Thus, in terms of textual resources, art historians use books and monographs, journals, correspondence, reports and conference proceedings, legal and governmental documents, photocopies of various material, notes, and bibliographic references (for example see Reed 1992, pp. 734-735; Beeman 1995, p. 96; Challener 1999, pp. 40-41, 45-46; Rose 2002, p. 37; Anagnostou 2009, p. 63). In addition to the above resource types, art historians have been found to engage with material in microforms such as audio tapes, video disks, CD-ROMs, facsimile editions, microfilms and microfiche (as in Bakewell, Beeman and Reese 1988, p. 31; Brilliant 1988, p. 122; Reed 1992, pp. 734-735; Rose 2002, p. 37); finally, videos and multimedia sets which include texts, images, and objects (Reed 1992, p. 735; Challener 1999, p. 28).

Of particular significance for the field are the rare books and manuscripts and the visual material, which are considered necessary for the successful conduct of research in art history. These information objects acquire additional value if the original art object is lost or difficult to access, as well as when the research subject itself places the art object in a secondary role; for example, when the main subject is the biography of an artist (as in Brilliant 1988, pp. 122-123; Bakewell, Beeman and Reese 1988, pp. 14-15, 22-31; Durran 1997, p. 3).

In the digital age, the places where art historians look mostly for the necessary information objects include various digital libraries and archives; databases with visual or other documentary material; digital journals and books; online thesauri, indices and dictionaries; discussion lists, various sites, relevant blogs and online communities (Brilliant 1988, p. 126;

Reed 1992, pp. 735-750; Durran 1997, p. 3; Kamposiori and Benardou 2011, p. 7). Harmsen, in 1996, argued that as the online material increases so will the level of importance that digital resources have for art historical research. Yet, although the use of digital resources has been significantly increased since Harmsen's observation and art historians consider them to be a standard part of their daily work routine, later studies showed that this does not necessarily indicate a greater degree of importance when compared, for example, with conventional resources; factors such as copyright or the quality of material available can affect their usefulness for scholars' work and, thus, their degree of importance (e.g. see Rose 2002, pp. 40-41; Zorich 2012, pp. 33-34).

Hence, it is widely known that scholars in the field still rely greatly on the conventional material for their research (Brockman et al. 2001, pp. 2-4; Rose 2002, p. 37). According to Rose (2002, p. 37), digital resources were more likely to be treated as secondary material than to constitute the basic information object. However, she noted that this preference occurs more due to habit and a feeling of insecurity about digital technologies than indifference about the possibilities they can offer (Rose 2002, p. 38). A similar attitude applies towards the original work of art and its visual surrogates; in the literature, a strong desire to distinguish the original artwork from its reproductions has been noted (Bakewell, Beeman and Reese 1988, pp. 11-12; Promey and Stewart 1997, p. 40). Moreover, the emergence of digital visual surrogates has not managed to substitute the necessity to visit and examine the artwork in person (e.g. see Rose 2002, p. 37). As lack of access, poor quality and copyright issues are problems art historians have to face frequently when dealing with digital images, the physical examination of the object seems unavoidable (e.g. see Durran 1997, pp. 9-11).

Yet, despite the difficulties met, visual surrogates obtain further value and can be treated as primary information objects if the original artwork is lost or inaccessible (Bakewell, Beeman and Reese 1988, pp. 14-15). Also, they are valuable tools for publishing and teaching in art history, as well as for the analytical method of iconography where the comparison between visual representations of art objects is the main concern (Brilliant 1988, p. 123; Bakewell, Beeman and Reese 1988, pp. 19-20; Beeman 1995, pp. 94-96; Dallas 1998, p. 219). Regarding digital images, more specifically, some of the recent studies in the field have found an increase in their use compared to previous years and, thus, suggested that scholars in the visual arts may have started trusting digital resources (Larkin 2010, pp. 53-54; Beaudoin and Brady 2011, p. 30).

In contrast to previous studies (Rose 2002, p. 39; Elam 2007, p. 5), the results of Larkin's (2010, pp. 53-54) research showed a new level of comfort with digital images in art historical scholarship. In particular, more than one third of the participants in her research agreeing to own a digital image collection were art historians. Yet, given the earlier argument about the different factors which often affect the usefulness of digital material for scholars' work and the fact that there are not many recent studies (especially since 2010) documenting how the behaviour of art historians has developed towards digital resources and the reasons behind it, it is challenging to draw any conclusions from the literature about present attitudes and use of digital resources in the field.

This thesis, as part of its goal to understand how art historians build their personal research collections, aims to explore researchers' use and opinions of digital resources and, thus, offer the current insight about this aspect of their behaviour that is lacking in the literature. The next sub-section will focus on the first stages of art historical research and the practices which often lead to the creation of personal collections.

2.3.2 The Initial Stages of Art Historical Research

In art history, the beginning of the research process and, therefore, the seeking of the needed information, is to a great extent linked with the scholar's intuition and memory. These two qualities, which are associated with connoisseurship,[8] apply especially to the case when research starts from the examination of the artwork. Brilliant (1988, pp. 121-122), for example, noted that scholars in the field, after mainly relying on their visual memory to examine a work of art, attempt to search for related information objects.

In fact, artworks can often inspire the initiation of the art historical research process through enabling the discovery of the research subject and the generation of research questions. These questions, in combination with the experience of the researcher lead to the searching of the required material. At this point, it is worthwhile briefly mentioning the concept of inspiration and how it enables information seeking. A similar behaviour with that encountered in art historians can actually be found in architects as studied by Makri and War-

[8] The difference between connoisseurship and expertise is explored by Nimkulrat, Niedderer and Evans (2015, pp. 2-3); 'expertise is considered the highest level of skill acquisition and knowledge within professional practice' while 'connoisseurship can be defined as fine discrimination, sharpened by continuous exercise' and is often linked to taste.

wick (2010). According to the authors, who examined the information seeking and use behaviour of architects, one basic characteristic of the discipline, in general, but also of the behaviour of scholars was creativity; for example, students in their research mentioned how the discovery of particular resources in their field inspired them with ideas for their current or future projects (Makri and Warwick 2010, p. 1758). Thus, it was argued that the electronic resources and systems which are intended to support this type of behaviour should be designed to enhance this fundamental quality of the research in the field (Makri and Warwick 2010, pp. 1767-1768).

Furthermore, one of the frameworks that Makri and Warwick (2010) used for identifying and analysing this type of behaviour in architects was Shneiderman's *Genex framework* (Shneiderman 2000, pp. 119-124) which is considered appropriate for understanding creative information work. This framework includes four creative activities- *collect*, *relate*, *create* and *donate*- and potential tasks associated with them (Makri and Warwick 2010, 1750). Shneiderman, though, suggested that these activities are non-linear while creative work may entail going back to previous stages when required or include repetitive tasks (Makri and Warwick 2010, p. 1750).

The relevance of this framework for this study lies in the fact that art history is a highly creative discipline in terms of its interaction with information; as argued earlier, an example of relevant behaviour is art historians' use of art works not only as information objects but also as a source of inspiration.[9] It may be useful to note that Shneiderman's framework, along with the ones mentioned at the end of the 'Modelling the Information Behaviour of Users' section (p. 27), will be useful for examining the behaviour of scholars participating in this current research.

Continuing with the examination of the first stages of the research process in art history, Bailey and Graham (2000) suggested that the types of information objects required each time for conducting a project in the field, as well as the way the research will continue, are determined by the research subject. At this early stage of the research, Bakewell, Beeman and Reese (1988, p. 111) argued that every possible resource may prove useful. However, when art historians start looking for information to support their research questions, they have to

[9] Digital images also facilitate the creativity and thinking process of art historians according to Graham and Bailey (2006, p. 22). The argument about art history being a creative discipline is further explored and supported through the presentation and analysis of this thesis's findings in later chapters (e.g. see pp. 96, 147).

deal with a variety of difficulties. The diverse information objects scholars need are usually scattered all over the world. Thus, travel becomes an inevitable part of the research process in the discipline (e.g. see Bakewell, Beeman and Reese 1988, p. 86; Beeman 1995, p. 95); however, it is important to mention that digitisation of information and the provision of online access to it have considerably reduced the time to seek and discover the necessary resources, while in many cases this activity has become more effective than before (Rose 2002, p. 40).

Durran (1997, p. 8) stressed the existing need in the field to gather material scattered throughout the world in one place. She also mentioned the need to deal with copyright issues, so as these resources can become truly accessible. On the other hand, Rose (2002, pp. 38, 40-41), found that the need for access to digital libraries has been covered to an extent. However, as previously argued, scholars' wish to access more visual material of high quality and resolution has not yet been satisfied. Similarly, Greenhalgh (2004) claimed that art historians' aspiration to easier access, seeking and discovery of the essential visual resources has not been fulfilled. The following part of this chapter which focuses on the information seeking practices of art historians will look at some of these issues in more detail.

2.3.3 Art Historians and their Information Seeking Behaviour

Considering the most important data in art history, they are the 'names, titles, places and dates' referring to works of art (Reed 1992, p. 734). Accordingly, Bates, Wilde and Siegfried (1993, pp. 14-15), in their study for the *Getty Online Searching Project*, confirmed the use of these terms during the seeking process in the Arts and Humanities. Yet, although direct searching is a possibility in art history, it is not usually chosen by scholars as an effective searching activity. Instead, chaining and browsing are the preferred information seeking activities in the discipline. In fact, these are two of the main reasons Beaudoin (2005, pp. 34-35) argued that art historians' information seeking behaviour matches Mann's (1993) 'Subject or Discipline Model' and 'Library Science Model' of information seeking as well as Bates' (1989) 'berrypicking' model (see. p. 21). According to these models, among some of the characteristics fitting art historians' information seeking behaviour are the great reliance on libraries for browsing material and the use of bibliographies, citations, indices and abstracts for tracking resources.

To begin with, chaining is a significant information seeking activity in art historical research and it is usually carried out through books, articles, bibliographic catalogues, references and footnotes (e.g. see Brilliant 1988, p. 126). Art historians prefer to use chaining not only for finding relevant research material, but also for staying up to date with the latest news in their field (Reed 1992, p. 752). In the digital environment, various databases, like indices and online catalogues, have been designed to meet these specific needs (e.g. see Reed 1992, pp. 737-741; Dallas 1998, pp. 225-226). Hence, many scholars appreciate the fact that this activity can be conducted faster in the digital environment, while it also provides them with the ability to print search results.

Regarding browsing, it tends to be a popular activity among Arts and Humanities scholars and has been traditionally conducted in libraries around the world. Brockman et al. (2001, p. 13) argued that this is because printed versions of books and journals are to a great degree suitable for browsing and easy to use. According to Palmer, Teffeau and Pirmann, as this activity

> […] tends to be broad and flexible, scholars encounter materials that would not be found through searching or chaining, and the new information may stimulate unexpected and fortuitous intellectual connections (Palmer, Teffeau and Pirmann 2009, p. 14).

In that way, browsing enables serendipitous discovery (Dallas 1998, pp. 217-218; Palmer, Teffeau and Pirmann 2009, p. 14), a valuable aspect of information seeking which should be taken into account when designing digital tools and services for enabling information searches.

It is well known that art historians are especially interested in browsing databases containing digital surrogates of artworks; indeed, they are one of the primary places of interest for searching visual material. However, although they consider them to be very useful, Durran (1997, p. 11) found that scholars complained about the time-consuming process of searching through a large number of digital surrogates. Therefore, in her study, researchers emphasised the importance of an initial limitation of results to help them find information relevant to their research.

Yet, apart from the above activities, networking and communication are also valuable for discovering resources of potential interest (e.g. see Bakewell, Beeman and Reese 1988, pp. 41, 75-78; Rose 2002, pp. 36-37; Grindley 2006, pp. 5-6; Kamposiori and Benardou 2011, p.

4). Stam (1997, pp. 28-29), specifically, referred to the communication between colleagues in the field as the 'invisible college' and suggested that it constitutes an important part of the information seeking behaviour of art historians.

Lastly, although some similarities in terms of the information seeking behaviour of different groups of art historians can be identified, there is a growing need to further examine some specific groups, whose needs and methods have been until now understudied. For example, the fact that scholars researching interdisciplinary or non-traditional subjects (e.g. non Western art, digital art) face greater difficulties while seeking information, demonstrates that their methods and needs lack thorough examination and support (also in Rose 2002, p. 41). Next, the literature around the building of personal research collections and their role in the art historical workflow will be presented.

2.4 Building Personal Research Collections in Art History

This part of the chapter is concerned with the practices surrounding the building of personal research collections in the field of art history and, thus, presents the results of previous studies on the topic. It should also be mentioned that many of the issues discussed here constitute the basis upon which the main argument of this thesis has been developed and the reasons why this research is needed. Understanding the key role this standard activity plays in research, as well as the criteria upon which scholars' personal collections are created, designed, used and managed can bring useful results for the facilitation of this process in terms of customised digital tools and services for scholars.

2.4.1 The Role of Personal Collections in Art History

In art history, the collections scholars create tend to include the wide variety of resources they manage to gather throughout their research career (e.g. see Elam 2007, p. 5; Beaudoin and Brady 2011, p. 32; Kamposiori, Warwick and Mahony 2017; Kamposiori 2012b, p. 619). Moreover, many scholars maintain analogue collections along with the digital ones due to the fear of data loss in the digital environment (Palmer, Teffeau and Pirmann 2009, p. 18). According to Beaudoin and Brady (2011, p. 32), scholars in their study preferred

to use resources in their physical personal collections, such as printed books, since they often faced problems when attempting to access online material and, especially, images.[10]

The personal pride scholars feel about their collections is an issue regularly mentioned. In Brockman et al. (2001, p. 9), one of the participants referred to his personal library as the 'credential catalog'. Also, Beaudoin and Brady (2011, p. 31) noted that personal image collections played an important role in the 'work-related image behavior of scholars' participating in their research. In fact, the above findings concerning the pride and emotional attachment scholars develop over their collections become more interesting if we consider the psychological aspects related to the activity of collecting in general (Terras 2009) or in the historical discipline in particular; regarding the latter, an example of this relationship can be found in Case's (1991b) study which used the cognitive psychology theory in practice to examine the conceptual organisation of information in the study of history.

An early study (Soper 1976, p. 409) looking at the personal collections of scholars in the sciences, social sciences and the Arts and Humanities revealed that, since these collections were built upon scholars' personal interests and were easy to access, scholars tended to use them as their first choice when they needed to find information. Soper (1976) was interested in examining the relationship between the size and composition of personal collections and the location of works referred to in certain of scholars' recent published papers. Thus, she discovered that most of the works cited in scholars' recently published papers were in their personal collections while a smaller proportion were located in institutional and departmental libraries (Soper 1976, p. 413). Despite the old date of the paper, her findings are very interesting; however, given that the majority of personal collections at the time consisted mostly of printed material and, since then, scholars' use of digital resources has significantly increased, further research is needed in order to examine which of these findings are still valid and what has changed since the time of this study.

To continue, personal collections in art historical scholarship facilitate both research and teaching. Collecting visual material can constitute a solution to difficulties such as problematic illustration of some art periods, inaccessible or deficient institutional collections, difficulties in the web retrieval of images, and low quality of surrogates (Bakewell, Beeman and Reese 1988, p. 19; Durran 1997, p. 11; Palmer, Teffeau and Pirmann 2009, p. 18). According

[10] As it will become evident during the presentation of our findings, especially in chapter 5, access problems were still an issue, affecting participants' preferences regarding information.

to Grindley (2006, p. 6), copyright issues, incompatibility of metadata, sustainability and robustness can be some of the key reasons for gathering material and building personal collections.

Moreover, Brockman et al. (2001, p. 8) argued that personal libraries in the Arts and Humanities facilitate the activity of reading, since they provide the advantages of easy access, portability and enable annotations. Case (1991a, pp. 76-77), after studying a group of US historians, noted that the activity of collecting is strongly related to the writing and assembling process since the collected material and notes helped the participants develop a better understanding of the subject they were researching.

Collaboration is another activity that could be enhanced through the building and sharing of personal collections; for instance, almost half of the participants in a research project conducted by the University of Minnesota Libraries (2006, p. 33) mentioned that their collections would seem useful to other researchers, while Beaudoin and Brady (2011, p. 32) discovered that their interviewees had an interest in contributing to large institutional databases through their collections. Finally, previous research has shown that creating and maintaining personal collections is an effective way for scholars in the field to keep track of the progress in the area of their interest (Soper 1976, p. 410; Brockman et al. 2001, p. 8).

To conclude, in this section we aimed to provide an idea of the reasons behind the building of personal collections both in art history and in the Arts and Humanities more generally. Given the lack of recent studies looking at this aspect of art historical research, bringing together any existing studies on the topic was necessary in order to demonstrate the importance that personal collections have for researchers in various disciplines and for art historians in particular. The following discussion will be directed to the organisation and management of personal research collections.

2.4.2 Organising and Managing Personal Collections in Art History

The building of personal information collections in art history not only constitutes an ideal choice for dealing with various issues regarding research and teaching in the field, but also for applying personal criteria when interacting with information. However, as collections grow, the need for their management emerges (Meho and Tibbo 2003, pp. 582-583; Palmer, Teffeau and Pirmann 2009, p. 18; Beaudoin and Brady 2011, p. 32; Borgman 2003, p. 3); in

art history, especially, this can be a very challenging task due to the format variety and the personalised practices involved.

Bakewell, Beeman and Reese (1988), in the published results of the Getty's *Art History Information Program (AHIP)*, noted that art historians considered the systematic organisation of information to be a vital stage during their research process; some of their interviewees referred to their struggle with keeping track of information as a 'matter of professional survival and success' (Bakewell, Beeman and Reese 1988, p. 44). Battin and Stam (1989, p. 23), similarly, referred to their research participants' difficulty with organising their own photographs and textual resources as well as understanding how other repositories were structured and organised.

In 2002, Rose observed that scholars in art history still continued to utilise traditional methods for storing, filing and organising information, as they could not afford the time and effort to learn new programmes that often did not meet their needs. She also argued that art historians studying non-traditional subjects (e.g. non Western art or digital art) may have different information needs (Rose 2002, p. 41); such an observation, though, inevitably generates questions with regards to the collection, storing and organisational habits of different groups of scholars in the discipline.

Thus, Beaudoin and Brady (2011, p. 32) recognised the existing need to support art historians with the creation, management and preservation of their collections, especially image collections, as most respondents in their study agreed that their technological skills were not adequate for developing and maintaining them. Since many scholars did not follow any particular archiving methods concerning digital images in their collections, the authors argued that information professionals should assist them in the filing and management process in order to enable the future retrieval of information.

At this point, it is worthwhile mentioning Case's statement (1991b, p. 657) about the new burden today's scholars have to face regarding the storage and retrieval of information which has always been challenging for them; the digital age has brought the additional problem of trying to keep track of digital information, along with piles of material in paper format. Finally, even in the more recent Ithaka S+R's report (Rutner and Schonfeld 2012, p. 23), the majority of the historians interviewed still considered the organisation and management of their analogue and digital notes and resources to be a primary challenge for them.

Having discussed, about the challenges that scholars in the field often face when attempting to organise their personal collections, it is necessary to proceed by looking in more detail at the criteria that scholars apply when they conduct such practices; the next section focuses on the employed conceptual criteria for organising and managing personal collection in art history.

2.4.3 Conceptual Criteria for the Organisation, Use and Management of Personal Collections

In the study conducted by Bakewell, Beeman and Reese (1988, pp. 46-51), art historians seemed to follow a lot of different approaches for organising and managing information. For instance, many scholars tended to organise their bibliographic references separately, whereas the overall information material they collected was usually organised by projects with the subject categories tailored to ongoing research. Another typical organisational system in art history was the one where the separation of information depended upon its intended use (teaching or research), a system that applied especially to the organisation of visual material, such as slides. Generally, the arrangement of information was described as a problem-solving process, essential for forming the intellectual inquiry in art history; for example, a scholar in their study tried to make decisions about their project by organising the research material in a specific way.

Case (1991a, pp. 76-77), similarly, identified a strong connection between the organisational stage of research and the writing process. More specifically, as the writing stage progressed, scholars tended to re-organise their cards and files accordingly so as to reflect the development of the scholarly argument and the transformation of their understanding of the topic. Furthermore, memory is strongly related to this stage of research in art history. For example, a scholar in Bakewell, Beeman and Reese's (1988, p. 49) study admitted that their memory was strongly topographical, since they could easily remember things being in 'a spatial rapport to one another'.

This comment reveals the key role the physical workspace plays in the organisational and curatorial habits of scholars. Case (1991b, pp. 662, 665), after studying the physical workspace of historians and their habitual behaviour at this stage of research, observed that even the most untidy workspace was actually organised in a way that meant something to the

scholar working there. Historians in Case's (1991b, pp. 662-666) study, very much like art historians, relied greatly on their memory for locating information and based the evolution of their filing and organisational systems on mental and physical aspects. Thus, he suggested that successful information systems should be created according to the patterns and needs scholars develop in the physical world and based on the motivation and purposes behind the practices they adopt.

Concerning art history, Beeman (1995, p. 96) mentioned that the ideal organisational system would take into consideration the organic quality of scholars' collections and the fact that art historians tend to organise their resources by project and not by subject. Bakewell, Beeman and Reese (1988, pp. 50-54), on the other hand, argued that art historians needed a system that would interfile and coordinate their collected verbal and visual material, whereas a scholar in their research wished for a system that would allow them to organise the visual material according to the analytical techniques used in art history, such as iconography. Finally, since many art historians seemed to work on many files and different formats of information at the same time, they would find useful a system that allows them to view various types of information at once.

To conclude, this section presented mainly the conceptual and habitual criteria scholars in the Arts and Humanities and, more specifically, in art history tend to apply when they build their personal collections. One of the main concerns of this current research is to examine further and, hopefully, understand the cognitive process underpinning the practice of collection building.

2.5 Chapter Conclusion

After reviewing the most important findings of the literature regarding the information seeking behaviour of users in art history and in the Arts and Humanities more generally, as well as the collecting and organisational behaviour of art historians, it can be argued that several of the issues mentioned call for further action and, thus, are of specific interest to this study. Firstly, given the rapid technological advances, many of the studies in the field can be now regarded as outdated and, hence, a re-examination of their findings is suggested in order for the field to remain attuned to new developments. Moreover, the fact that there is little research on the personal collecting behaviour of scholars- both generally and in art history,

more specifically- along with the constant increase in the collection, creation and use of digital data by researchers, demonstrates the importance of this thesis for creating a more complete picture of core scholarly practices that take place 'behind the scenes' and that we know little about.

Furthermore, some additional matters raised during this chapter are worth stressing again here. In particular, since most of the previous research has focused on the needs of art historians studying more traditional subjects (e.g. European art), there is a growing need to examine the practices of understudied groups of scholars, such as those conducting non-traditional research (e.g. non-Western art, computer art or digital art), as their needs may differ considerably. Also, given the hesitant stance of scholars in the field regarding digital technologies, it is worthwhile considering further if there are any disciplinary issues contributing to the maintenance of this attitude and what type of support art historians may need in order to overcome them. These issues were taken into consideration during the design of this thesis's methodology and the interpretation of its results, both of which are going to be presented in the following chapters.

Finally, concerning the building of personal collections, the problems art historians usually face when trying to use digital tools and services for organising information in the digital age also highlight the need for further study on their information practices and needs. Recognising the importance of personal information collections for art historians and identifying the cognitive aspects upon which the creation and management of these collections are based are essential for facilitating their research with personalised tools and services. In the next chapter we will discuss in more detail how this could be achieved as well as the rationale behind the methodological approach employed in this study.

CHAPTER 3: METHODOLOGY

3.1 Methodological Approach

The aim of this study was to examine how scholars in art history create, design, use and manage their personal research collections. Behind the motivation of this thesis rests the belief that we should develop a sound understanding of core scholarly practices in the field- such as information gathering and organisation- in order to facilitate them with appropriate digital tools and services. Thus, we concluded that, for the purpose of gaining a good understanding of the behaviour and needs of art historians, a qualitative research approach would produce richer data. Indeed, conducting interviews, combined with the observation of scholars' personal collections, gave a unique view of the researchers' personal workspace and practices which would have been difficult to achieve by using any other approach.

3.1.1 Interviewing

Regarding interviewing, there are several advantages in choosing this method. Apart from being a suitable method for looking at the personal behaviour of users, it allows researchers to develop a good level of closeness to their participants; this, in turn, can lead to the development of greater trust between the interviewer and the interviewee and, thus, in more useful and interesting data.

Thinking about the main types of interviews, they can be *structured*, otherwise known as *survey interviews*, or *unstructured*, or else *in-depth* or *intensive* interviews (Gorman and Clayton 2004, pp. 126-127). Regarding unstructured interviews, in particular, they can be conducted in different ways according to the objectives of a project; for example, the researcher can use the same questions in each interview session, or have an interview guide with some predefined topics (known as *semi-structured interviewing*),[11] or follow a more informal conversation with no prepared questions or topics (Patton 1990, pp. 288-289).

[11] For example, see Bryman (2012, p. 471).

For the purposes of this study, we chose to conduct semi-structured interviews. These were conducted either face-to-face or via Skype.[12] Concerning the Skype calls, it was usually left to the discretion of the research participants to decide whether they would be voice only or video. Given that the purpose of this study did not include an analysis of aspects of the interview which could have been facilitated through the use of the camera (e.g. analysis of the interaction between interviewer and interviewee), choosing between these two types of call was not a methodological concern.

The interview guide had mainly open-ended questions (e.g. starting with 'how', 'what', 'why'), organised into categories related to the topics to be discussed with the interviewees. Whenever a closed question was used (answered with 'yes' or 'no'), it was generally followed by another type, such as an open-ended, asking the participant to elaborate on the answer. In addition, the format of the semi-structured interviews allowed us to examine the topics formed by our research questions while maintaining a degree of flexibility. According to Bryman (2012, p. 487), flexibility is one of the key features of semi-structured interviewing, as it enables the researcher to examine further issues and topics that arise during the interview which may be of interest to the study.

Therefore, when it was considered appropriate, and since the interviews were conducted in a conversational tone, the discussion could be directed to other topics; this occurred when the interviewees, depending on their various interests, practices and experiences, raised issues that could be of value to this research and could allow for the examination of the data from different angles. As a result, it became possible to get a good insight into the interviewees' practices and habits during the building of their collections and learn about the personal criteria being applied at different stages of this process. Finally, since many of the previous studies in this field have used interviews as a data collection method, our results can be more easily compared and evaluated on the basis of previous findings.

3.1.2 Observation

Although interviewing was chosen as the main data collection method, observation was adopted as a secondary method, which would be conducted during the interview sessions

[12] More information on the reasons behind the decision to conduct both face-to-face and Skype interviews and on the data collection process is provided later, in the 'Beginning the Fieldwork' part of the chapter.

and, thus, have a more supportive role. Observation is divided into two categories: *structured* and *unstructured observation* (e.g. see Gorman and Clayton 2004, pp. 103-104). Structured observation usually includes predetermined activities for the participants, while the researcher observes and notes down- for example, by ticking boxes in a form- if particular behaviours occur during these activities. Unstructured observation, on the other hand, is more flexible, with the observer noting down any of the behaviours or activities which take place and may be of interest to the study and its research questions.

Before we present our observation approach later in this chapter, it is worth mentioning the various perspectives a researcher can employ during observation. According to Gorman and Clayton (2004, p. 106), the qualitative researcher can choose to have an *unobtrusive role*, follow a more *structured approach*, or adopt the *participant role*. Concerning the structured perspective, though, the researcher can either hold an *observer-as-participant* or *participant-as-observer* role; in the former scenario, the researcher mostly observes, but intervention is possible in order, for example, to ask for any clarification, whereas in the latter occasion, the researcher has a more active role, for example in order to develop a better degree of familiarity with the participants and the events taking place. Yet, the decision to follow a particular perspective should always be based on the research questions and objectives of a project, on the setting of the observation and on those being observed (Gorman and Clayton 2004, p. 107).

Observation is a method very often combined with interviewing, for instance in ethnographic research (Riemer 2012, p. 172). Concerning the use of observation in our project, we decided to employ an approach that could easily be coupled with interviewing. Thus, considering our position during observation and the fact that our primary method was interviewing, which was conducted in a conversational and engaging way, it was not possible to hold an unobtrusive stance; yet, it was not possible to adopt the participant perspective either, as the design of this research did not allow for active participation in events. Instead, we chose to follow a position similar to the *observer-as-participant role* which also resembles Bryman's (2012, p. 444) *non-participating observer with interaction*[13] role.

Since observation was combined with interviewing, this approach was considered the most suitable, allowing us to observe while asking questions aiming to clarify what was being

[13] The researcher employing this role observes without participating in activities; however, interaction with the participants occurs through the use of another method, such as interviewing (Bryman 2012, p. 444).

said during the interview. It also permitted the development of greater closeness to the research participants which, in turn, proved beneficial for the purposes of our primary method, interviewing. Thinking about the *observer effect*, *researcher effect*, *reactivity*, or the *Hawthorne effect*,[14] the approach followed here did not require the type of in-depth and prolonged involvement usually employed in ethnographic studies and, thus, it was not a great concern for this study.

However, it should be mentioned at this point that observation, being a secondary method in our study, was not always possible; this occurred either because we could not get consent from the participants or due to difficulties in accessing their personal workspaces for reasons that will be explained in a later section. Having a more supportive role, though, observation in our research allowed for great flexibility. Thus, in some of the interview cases, alternative approaches, as close to observation as possible, were followed in order to facilitate the discussion- again, they will be presented later. Observation, as used in our project, enhanced our understanding of scholarly practices conducted in the personal workspace of art historians. In fact, it constituted a tool for supporting the development of rapport with our participants; it triggered participants' memories and thoughts which proved valuable for the objectives of the interview, while it helped verify to some extent what was being said during the interviews.

3.1.3 Data Reliability and Validity

According to Kirk and Miller (1986, p. 19) 'reliability is the extent to which a measurement procedure yields the same answer however and whenever it is carried out; validity is the extent to which it gives the correct answer'. Gorman and Clayton (2004, pp. 56-57) presented four methods for achieving reliability. Firstly, *consistent notetaking* is one of the most popular ways to ensure reliability and one often employed by qualitative researchers. Another method is *immersion in the context* and it is, basically, the active participation of the researcher, at different times in a day and over a period of time, at events which take place and

[14] It refers to the influence a researcher can have on the people and the events they observe (e.g. see Shipman 1997, p. 99); for example, when someone is observed they may act in a different manner than they normally do. It concerns especially ethnographers since research in their field often requires prolonged involvement in the lives of those observed and this can cause reactive effects (Bryman 2012, pp. 495-496), having a negative impact on the credibility of the study.

are related to issues under examination. Next, *exposure to multiple situations* means experiencing different events and activities related to the issue under study. Finally, the fourth suggested way of achieving data reliability is to *draw upon other research for assistance*.

Validity, as mentioned earlier, is associated with the production of true and accurate results and it can only be achieved if the results are also reliable. According to Gorman and Clayton (2004, p. 58), 'there are three basic components of validity, each of which has a bearing on generalizability - the ability to draw defensible general conclusions from the evidence one has obtained': these are *face validity*, *criterion validity*, and *construct validity*.

The first, face validity, is principally achieved when the researcher produces results that match pre-existing expectations or, in other words, when the results seem reasonable to the researcher; however, there is always the possibility of the *effective surprise*, or else the chance to come up with unexpected findings (Gorman and Clayton 2004, pp. 58-59). In that case, the researcher is responsible for explaining and defending the findings. This type of validity is to some extent similar to LeCompte and Goetz's (1982, pp. 44-50) internal validity which is accomplished when the connection between the researcher's observations and the theories they produce makes sense.

Secondly, criterion validity is associated with the use of more than one method in research which can increase the chances of having accurate results; also, in that way, it is similar to *triangulation*[15] (Gorman and Clayton 2004, p. 59). Finally, construct validity can be achieved through using, for example, a theoretical framework while analysing the data collected; moreover, at this stage, as well as throughout the process of theory building, the researcher should explain any results that might not fit the chosen analytic framework (Gorman and Clayton 2004, p. 59). Yet, Gorman and Clayton (2004, p. 60) suggested one more method for ensuring validity and this is called *member checks* or else allowing other members, for example in an organisation or a team, to check whether the final results seem reasonable.

Having briefly presented some of the basic techniques for achieving reliability and validity in research, it is worth noting some additional evaluation principles that apply especially to qualitative research. According to Guba (1981), Lincoln and Guba (1985), and Guba and

[15] Triangulation is the collection of information from various sources about the same event or behaviour: it enhances a research project and, when conclusions are drawn after using different means, they are more likely to be correct and accepted as such. Also, using mixed methods can help eliminate the weaknesses of each method and combine their strengths (Gorman and Clayton 2004, p. 13).

Lincoln (1994), *trustworthiness* and *authenticity* are two criteria which can be used instead of reliability and validity for evaluating qualitative research. Trustworthiness, particularly, consists of four elements and can be achieved through various methods (Guba 1981, pp. 84-88):[16] *credibility*, which is achieved through activities such as triangulation or member checks; *transferability*, which is attained by employing a sampling technique such as the theoretical or purposive sampling or through collecting and using *thick* data and descriptions;[17] *dependability*, which is achieved through methods such as triangulation; and *confirmability*, which is accomplished through the use of mixed methods and the practice of reflexivity (e.g. being open about research decisions).

On the other hand, authenticity, which consists of five criteria- *fairness*, *ontological authenticity*, *educative authenticity*, *catalytic authenticity* and *tactical authenticity*- is concerned with issues related to the broader impact of research on society (e.g. practical implications of research) (Guba and Lincoln 1994, p. 114). Finally, Rubin and Rubin (1995, pp. 85-91) proposed three criteria for evaluating qualitative research, including work employing interviewing as a data collection method; these criteria are *transparency*, *consistency-coherence* and *communicability*.

In this study, we employed a number of methods which work as a means for achieving reliability and validity. Considering reliability, and based on the techniques mentioned above, consistent notetaking was one of the methods used. In particular, taking notes immediately after the interview and observation took place ensured that there was a second account of the recorded conversation in case something went wrong with the recording or as a reminder of behaviour not possible to be captured otherwise. Moreover, taking notes was the only way of recording information that was of research interest during the more informal parts of the conversation when the recorder was not in operation. Finally, gaining photographs of scholars' personal collections worked as a visual method of notetaking and proved valuable during the analysis stage, when parts of the interviews' transcripts and the fieldwork notes were compared to the images representing parts of the scholars' collections.

Secondly, and as mentioned earlier, we often had the chance during an interview to observe the participants' collections, either all or a part of them, as well as their personal

[16] Selected methods are presented here. For the full list see Guba (1981, pp. 84-88)

[17] The term *thick* refers to rich and detailed accounts of the data gathered for the purposes of qualitative study, which place it in specific contexts, as well as of any activities conducted for its collection, analysis and interpretation.

physical or digital workspace.[18] Having the chance not only to converse with scholars but also to see how they conducted their work, or, in other words, holding the observer-as-participant role, was an opportunity for getting more exposed to scholars' preferences and ideas towards the issues we were interested in; thus, this constituted an additional method towards ensuring reliability.

Thirdly, it is worthwhile mentioning that a great deal of the previous literature focusing on examining scholarly practices and behaviour has used interviews and observation as the tools for achieving their goals; the studies focusing especially on art historians' behaviour almost in their entirety have used interviewing as their principal method of investigation. Therefore, drawing upon previous research conducted in this field, both while designing the study and during the analysis stage, was an additional technique to ensure the reliability of the results.[19]

In fact, being familiar with the previous research in this field, not only worked as a method for achieving reliability, but also for validity. More specifically, since the majority of the previous studies used a similar approach for examining the behaviour of their participants, it was easier to distinguish which of our results met any pre-existing expectations regarding the practices of this group of scholars and which of them were different or, maybe, new. Thus, comparing our results to those from previous literature facilitated our understanding of which of our results 'made sense' and which of them needed further explanation or, even, further investigation; in other words, this technique helped us achieve face validity.

Moreover, the use of established information behaviour models, during the analysis stage, as a conceptual framework for understanding the information practices of scholars, was necessary for explaining particular phenomena and developing our theoretical observations. As a result, we were able to examine our findings in context, make relevant connections and provide explanations for those of our findings that appeared not to fit this context; also, by doing so, we could work towards ensuring construct validity.

Furthermore, our decision to use two different methods in our approach, interviewing and observation, constituted a technique for establishing, apart from triangulation, criterion validity as well. In particular, getting an insight of our interviewees' working habits during observation not only ensured the acquisition of richer data, but also worked as a validation of

[18] Details regarding this aspect of the research will be provided at a later stage.

[19] Relevant examples of studies are provided later, e.g. when discussing the sampling approach.

what was being discussed at the actual interview. Finally, as will be explained later, conducting pilot interviews before the main phase of the data collection process, involving our interviewees in the research process by asking them to confirm the accuracy of the interview transcripts' content, and presenting our work at several meetings and conferences were methods for receiving valuable feedback regarding our project; in fact, this practice worked as the aforementioned member checks, and facilitated the production of valid results.

Actually, many of the techniques which were employed for accomplishing reliability and validity worked for meeting many of the additional evaluation criteria suggested by Guba (1981), Lincoln and Guba (1985), Guba and Lincoln (1994) and Rubin and Rubin (1995). For instance, the use of interviewing and observation as data collection methods enabled us not only to attain triangulation, but also to achieve greater immersion in the context and, thus, a deeper understanding of the practices and experiences of our interviewees. Moreover, the use of different methods in combination with the employment of techniques, such as purposive sampling[20] and consistent notetaking, led to the acquisition of richer data and the provision of thick descriptions of our methodology and findings. Also, comparing this study's results with previous findings in the field required a detailed discussion on the approach and practices employed in current research as well as a thorough explanation of any contradictions or inconsistencies in the data.

Finally, gaining feedback at different stages of the research and using the member checks technique facilitated the openness of the study and worked as a method for tackling research bias.[21] More specifically, after creating the first draft of the interview transcripts, each transcript was sent back to the corresponding research participant for feedback. The scholars who participated were asked to confirm the content of the transcripts as well as comment further on them if they considered it necessary; in fact, several participants sent back comments and corrections with regards to information in the transcripts, such as names of people or places, which significantly enhanced the transcripts. In the cases where participants asked for parts of the transcriptions to be removed or added new, these were signified through the use of related comments in brackets by the interviewer. All in all, the aforementioned practices allowed us to meet many of the criteria related to trustworthiness, such as

[20] More information on the sampling techniques follows.

[21] Research bias constitutes an issue that concerns especially scholars employing qualitative methods, such as interviewing and observation. Member checks were included in the strategies suggested by Lincoln and Guba (1985, pp. 281-284) for controlling bias.

credibility, transferability, dependability, and confirmability, as well as transparency, consistency-coherence, and communicability.

3.2 Data Collection

After deciding on the methodological approach and the most suitable methods of investigation that could help us achieve our goal, we proceeded to the essential preparation. In this part of the chapter, the focus will be placed on the steps undertaken to collect our data. We will present and discuss the sampling, interviewing and observation process as well as stress the limitations of this research and any other methodological issues that arose before, during and after the fieldwork.

3.2.1 Preparing for the Fieldwork

The first step at this stage was to create an interview guide which consisted of three groups of questions which would permit exploration of the issues we were interested in while ensuring a smoothly run discussion with the research participants. However, since the aim was a semi-structured conversation, it was important that the chosen questions should allow flexibility; keeping some degree of control over the conversation should not prevent a change of topic when interesting issues arose due to the potentially different experiences of our interviewees.

Therefore, through the three categories of questions in the interview guide, we planned to explore three different themes concerning personal collections in art history. These were information gathering and the creation of personal collections; organisation and management of information; use of personal collections in research and teaching. Yet, at the beginning of the interview, it was considered necessary to include some questions regarding the research topic, teaching and interests of the participants. This would give the interviewees the time to feel more at ease by talking about a topic in which they felt confident, but it would also make easier the task of drawing connections between the research and teaching interests of scholars and their information gathering, use and management habits. This type of questions is also similar to what Bryman (2012, p. 476) called *introducing questions*.

Another consideration while planning the interview guide was the issue of time. Thus, the duration of the interviews was decided to be around one hour. The reasoning behind this decision was that having a one hour slot for the interview would be enough to explore the issues we were interested in, but without asking too much in terms of the interviewees' per-

sonal time; also, a reasonable time slot was more likely to attract scholars' interest in participating in the study. However, it was anticipated that the conversation time might vary depending on the experiences of each interviewee as well as because of the semi-structured format of the interview and the level of flexibility it allowed. Also, when observation of scholars' personal collections was part of the interview, it was anticipated that the duration of the interview might be different when compared to the cases where we did not have this opportunity.

Nevertheless, when the first version of the interview guide was ready and before proceeding to the fieldwork, it was considered necessary to conduct a pilot study in order to test the possible duration of an interview based on the created guide. This would also give the chance to get feedback regarding the questions and overall interview experience which would prove very useful for the project; in fact, this would allow an evaluation of the work done up to that point and constitute part of the preparation for the formal part of the data collection phase. Conducting a pilot study is highly recommended by several studies on qualitative research methods. Schensul (2012, p. 100) suggested that conducting a pilot study, for example pilot interviews or observations, will enable the researcher to practice how to best ask questions.

As a result, we conducted three pilot interviews by using a guide including ten questions. In one case the process also included observation of the scholar's digital personal collection which also gave the opportunity to test how this method could be integrated into the interview procedure. Regarding the participants, since data collecting was not our primary concern at that point, it was not considered necessary for the pilot study to recruit only scholars working in the field of art history. The interviewees who took part in the pilot study were scholars already known to the interviewer. An advantage of this was that the recruitment time was significantly reduced and, thus, it was easier to quickly proceed to the next step. Another was the greater possibility of them talking more openly about their interview experience and what they thought were its strengths and weaknesses.

After each pilot interview, the interviewees were asked to talk about the experience and to provide any comments they had on the process. Based on their feedback, but also on the experience gained from conducting this pilot study, the interview guide was reviewed and, slightly, altered; for example, the wording in some of the questions was changed to express clearly the main issue under exploration and, then, sub-questions were added to explore dif-

ferent aspects of this issue. Also, some of the sub-questions were formed to work as suggested points for integrating observation into the process.

This modification enabled us to work towards resolving an additional issue discovered via testing the interview guide. Actually, interviewing the participants by using the pilot interview guide took much less than the hour originally planned. Therefore, re-designing some of the existing questions and adding new ones not only made clearer to the interviewees the issues that were of interest, but also allowed the interviewer to take full advantage of the time available and get in-depth details regarding their practices and habits. Consequently, the final design of the interview guide included sixteen questions (see Appendix II); these questions had sub-questions covering various aspects of the issue examined in their main part, enhancing the conversation and helping to acquire richer data.

The next step was to create a consent form and an information sheet (Appendix II) that would be sent to the potential interviewees. This step was essential for two reasons: the first was to provide scholars with all the information they needed regarding the context of the project and the aim of the interviews whereas the second was to inform them on their rights in terms of data protection issues. Both the consent from and the information sheet, along with the interview guide, were required for the process of registering the project with the UCL Legal Services. For the purpose of designing the aforementioned documents, the UCL Data Protection Policy and the Data Protection Act 1998 (DPA),[22] along with the information provided by the UK Data Archive[23] regarding ethics and consent in research, were taken into account. As a result, the project was examined to ensure that it complied with the above Policy and Act, and the final decision gave the official confirmation for beginning the fieldwork.

3.2.2 Beginning the Fieldwork

3.2.2.1 Sampling

After getting approval from the UCL Legal Services, the next step was to recruit the research participants. The initial target was set to twenty to twenty-five interviews which con-

[22] More information regarding the UCL Data Policy and the Data Protection Act 1998 (DPA) can be found at https://www.ucl.ac.uk/legal-services/data-protection-overview.
[23] UK Data Archive, http://www.data-archive.ac.uk/create-manage/consent-ethics.

stituted a considerable sample for the purposes of a qualitative research study. Other qualitative studies conducted for projects of different scales but which explored issues relevant to those studied here have used similar numbers of participants. In Benardou, Constantopoulos and Dallas (2013, p. 114), we read that the number of participants interviewed (through semi-structured interviewing) in the context of the large European infrastructure projects DARIAH and EHRI was twenty-four and fifteen respectively; the purpose of this work was to understand scholarly practices and information behaviour of scholars in the Arts and Humanities for creating better digital tools and services for research.

Smaller scale projects examining issues around information seeking behaviour or personal information management have also employed similar approaches. One of the earlier studies looking at the way historians organise and manage information, conducted by Case (1991b, p. 661), used interviews of twenty scholars, along with observation of their personal collections, to understand their behaviour. A more recent project, looking at the building of personal collections, by humanities scholars interviewed twenty-six scholars (Trace and Karadkar 2017, p. 491) in order to draw user requirements for a mobile application that support related practices (e.g. document capture and uploading information to cloud storage). Recent qualitative studies around information seeking using interviews to understand the practices of scholars are those by Martin and Quan-Haase (2016) and Zhang and Soergel (2016); the first, which focused on exploring the role of agency in historians' experiences of serendipity in the digital and physical environment, had twenty interviewees (Martin and Quan-Haase 2016, p. 1009) while the latter, which examined patterns and conceptual changes in knowledge representations during information seeking and sense-making, had fifteen participants who were interviewed and conducted think aloud tasks (Zhang and Soergel 2016, p. 64).

Before continuing, though, with the sampling and recruitment process in this study, it is essential to briefly mention some of the most common sampling techniques in qualitative research. In contrast to quantitative studies, in qualitative research 'an appropriate sample size […] is one that adequately answers the research question' (Marshall 1996, p. 523), and this, in fact, might be relatively small. Concerning the most appropriate sampling techniques for qualitative research, they include selecting a *convenience sample*, a *theoretical sample*, or a *judgement or purposeful sample* (Marshall 1996, p. 523).

Selecting a judgement or purposeful sample is the most common approach in qualitative studies. In this case, the researcher usually chooses the most appropriate sample for the purposes of the project and the decisions are usually based on criteria such as the researcher's knowledge of the field, the literature in the area of study or data already collected in the project. The researcher can employ additional strategies when recruiting participants, like choosing subjects with specific expertise (*key informant sample*), specific experiences (*critical case sample*) or participants suggested by others (*snowball sample*) (Marshall 1996, p. 523).

Concerning this research, the principal sampling technique employed was the *purposeful sampling*. However, when considered necessary, it was complemented with additional approaches and, in particular, with *snowball*, *targeted* (see Schensul 2012, pp. 84-85), and *key informant sampling*. To begin with, our criteria for selecting interviewees were not only based on the aim and the research questions of the project, but they were also informed by the previous literature in the field; for example, authors of previous studies have highlighted the need to study art historians who conduct research on non-traditional topics (e.g. non-European, digital art) (e.g. see Rose 2002, p. 41), while there are few studies in the field interviewing participants who employ digital practices in their research.

Thus, initially, we were very keen on interviewing scholars who belonged in the above categories. However, it was finally decided that by creating a pool of interviewees representing different scholarly groups under the more broadly-defined discipline of art history- including the ones that we were initially interested in- would enable us to compare their practices and, eventually, develop a better understanding of their information behaviour. The aim was to create a pool of participants which included scholars conducting traditional as well as non-traditional research, both in terms of topic and practices. However, at this point we should highlight that we initiated the recruitment process with the assumption that scholars researching on a non-traditional topic may not necessarily employ digital practices or the reverse. Also, we were open as to what kind of digital practices we would like our interviewees to employ; the only criterion was that, in terms of the participants' research, there should be some kind of digital practice involved in the process other than using digital services to find information.

As a result, the initial stage of recruiting participants included contacting various Universities with relevant departments in London, UK as well as distributing a call for participants at organisations such as Computers and the History of Art (CHArt) and the Association

of Art Historians (AHH). Several announcements to relevant mailing lists and blogs were made, while the information was distributed through social media, for example Twitter. At some point, though, during the interviewing process, a difficulty arose regarding the recruitment of the target number of participants; in fact, after initiating the process of the face-to-face interviews, a limited response to the call for participation was encountered. Although we cannot be totally certain, potential reasons include the time period chosen to conduct the interviews- the majority of them were conducted over the summer 2013- and, possibly, a limited engagement with the study given its stress on the use of digital methods.

Previous literature in the field has argued that art historians are hesitant about using digital technologies (e.g. see Zorich 2012, pp. 19-22; Cuno 2012), which may explain the lack of participants in our study. Several prospective participants initially registered their interest in the project, but then chose to drop out of the study during the second stage of the recruitment, when they received the full information pack with the details on the process. As a result, after facing the above issues almost from the beginning of the data collection process, and due to time constraints, it was considered necessary to continue with the recruitment process while at the same time conducting the interviews with those participants already recruited.

Thus, the first decision was to open-up the study and include Skype interviews along with the face-to-face ones. This practice would allow us to limit any geographical barriers imposed by the face-to-face interviews and, thus, potentially increase our pool of interviewees. This strategy indeed brought more participants to the study; however, employing complimentary sampling techniques was necessary in order to gather a pool of scholars matching the required characteristics.

Therefore, and as mentioned above, the recruitment process was complemented with the employment of the snowball sampling technique. More specifically, the strategy was to first ask the interviewees to introduce us to any of their colleagues that they considered fitted our criteria. Also, apart from the interviewees, other colleagues were asked to introduce any scholars they knew who matched the criteria and who may have been interested in participating. Yet, although this method proved effective to some extent, we were still short of scholars with specific characteristics. For instance, finding scholars who employed digital practices as part of their research and who were interested in participating proved a challenging task.

For that reason, additional sampling approaches were followed: the targeted and key informant techniques. In the first case, in particular, it was considered necessary to look for scholars employing digital practices by targeting sites where it was anticipated that scholars meeting these criteria could be found. Thus, based on the interviewer's knowledge of the small community of art historians on Twitter, it was decided to target this site in order to find additional interviewees with the desired characteristics. Additionally, in terms of the key informant sample, a search through institutional webpages for scholars in the relevant departments of UK Institutions was conducted in order to locate art historians specialising in areas of interest to this study; these scholars were contacted directly.

Finally, although the last from the additional sampling techniques employed did not prove as effective as the other two, the goal of gathering a group of scholars meeting the criteria required for conducting the study was ultimately achieved. Thus, despite the difficulties met, the number of interviewees recruited for this study reached twenty which, as previously mentioned, was the minimum target number of participants. However, in order to attain that number, it was required to extend the interviewing period by a month which constituted an additional challenge in terms of time constraints and the need to proceed with the next phases of research.

As a result, twenty interviews were conducted from June 2013 to October 2013. Regarding the scholars participating in our study, they ranged from PhD students and early career scholars to senior scholars and independent researchers. However, it is worthwhile mentioning that many of our interviewees held more than one role at the time of participation. For instance, some were PhD Students at one University and Lecturers or Tutors at the same or another Institution (either University or museum), while others were associated with a University as well as conducting independent research (more information on scholars' career levels will be provided in the next chapter). Although most of the participants were working on individual projects, two of them were involved in larger, collaborative projects. Also, some of the scholars had more than one projects under way. At the time of the interviews, most of them were based at UK institutions, while two scholars were based in Europe and another two overseas. Finally, eleven of the participants were female and nine of them male.

Thinking about the criteria at the beginning of the sampling process and the initial goal in terms of the profiles of scholars that were of interest to this study, a group of art historians as close to the initial target as possible was finally gathered, despite the problems faced

during the recruitment process. More specifically, eight of the interviewees could be considered to conduct non-traditional research, either based on topic or practices, while twelve conducted traditional research. Regarding the scholars conducting non-traditional research particularly, two of them were working on a non-European subject, one in digital art and another one in the creation of guidelines for 3D documentation of material culture, while one of them employed a non-traditional methodological approach (quantitative).

Also, six of the participants employed digital practices as part of their research which, for the purposes of this research, means that they either used digital data (e.g. mailing lists, digital art objects) as objects of study and not only as information objects or they employed digital methods to examine their topic or that the outcome of their project was digital. Concerning the rest of the scholars, their research involved work mostly on European subjects and the use of traditional methods of enquiry. However, we should mention that one of the participants was researching aspects of a non-European culture, but in a European context; adding, though, the fact that the methods and all other aspects of research were of a more traditional nature, it was decided to categorise this work as traditional research. Yet, it should be highlighted that, even when dealing with a more traditional topic, scholars had frequently to employ an interdisciplinary approach or more than one method in order to explore the issues they were interested in; in fact, this greatly complicated the information practices involved, from the discovery to the management of information, causing issues on which we will elaborate at a later stage.

At this point, given that most of the scholars were based in UK institutions, it is worth presenting some general information about the discipline of art history in the UK which will provide the necessary context for the sample used in this study (as described above). Art history in the UK is practiced in academic, cultural heritage (e.g. museums, auction houses) and, sometimes, secondary education institutions (e.g. see Haynes 2008). Since this thesis focused on research and teaching practices in academia, we will attempt to give an idea of the state of art historical scholarship in Higher Education (HE).

To begin with, art history is taught both at undergraduate and postgraduate level while there is a great variety of courses and modules teaching the history of art across centuries and countries as well as combining it with other areas of enquiry (e.g. Arts and Humanities). The ‘Higher Education Statistics Agency’ (HESA) uses the term ‘history of art’ to categorise any

student and staff data in this disciplinary area.[24] Although art historical scholarship can be practiced and taught in the context of other areas of the Humanities and Creative Arts as well, for practical reasons we chose to use the umbrella term 'history of art', as employed by HESA, in order to search for related information (e.g. course information) on other websites. Also, history of art has been categorised by HESA under the 'Historical and Philosophical Studies' rather than 'Creative Arts and Design'.[25]

A search of the 'Times Higher Education World University Rankings' website using this term revealed 1,228 results (mostly BA and MA courses).[26] To gain results as closely related to this term as possible, it was necessary to search within the category 'History, Philosophy & Theology'. Still, the results showed that the study of art history is often combined with many other areas, such as Literature, Fine Art, Curation, Architecture, Archaeology, History, Cultural Studies, Linguistics. Regarding PhD level studies, a search of the 'Postgraduate Search' website using the term 'history of art' and selecting the 'PhD' qualification type category revealed 13 results.[27] Again, it should be noted that, similar to other types of art historical research, doctorate level research can be conducted in the context of other Arts and Humanities areas as well and across institutions (e.g. collaboration between academic institutions or between academic and cultural institutions). According to the 2012/13 (the year when our data collection took place) HESA Student Record, the number of students (all levels) studying (V350) 'history of art' at the ten UK HE providers with the highest numbers for that year was 7185 (see Appendix III for the full list).

Regarding UK academics, according to the 2012/13 HESA Staff Record, the number of staff with an element of current academic discipline (V350) 'history of art' at the ten UK HE providers with the highest numbers for that year was 420 (see Appendix III for the full list). Thinking about the areas of interest to art historians based in the UK, they can vary widely. Looking at the 'Art Historians & Arts Professionals Member Directory' of the Asso-

[24] The most recent (2016/2017) discipline labels used to categorise staff records that can be found on the HESA website can be viewed at https://www.hesa.ac.uk/collection/c16025/a/curaccdis. The most recent (2016/2017) qualification subject labels used to categorise student data can be viewed at https://www.hesa.ac.uk/collection/c16051/e/qualsbj. It is worth noting that similar labels were used for the same categories of data in 2012/2013 when our interviews were conducted; for staff records, see https://www.hesa.ac.uk/collection/c12025/pdf/C12025.pdf and student records, see https://www.hesa.ac.uk/collection/c12051/pdf/c12051.pdf.

[25] See https://www.hesa.ac.uk/support/documentation/jacs/jacs3-detailed.

[26] See https://www.timeshighereducation.com/search/course/subject.

[27] See https://www.postgraduatesearch.com/phd.

ciation of Art Historians (AAH),[28] we can get an idea of the subject areas on which academic and professional art historians work; these relate to the history of art across eras and geographical locations. It is worthwhile commenting on the small number of members conducting research on a digital art history topic or employing digital methods. A search by using the term 'digital' revealed only 3 results (from a total of 125 members) which generates questions regarding the proportion of art historians conducting digital research in the UK; this might justify to some extent the difficulty we faced in recruiting participants in this area.

However, although the AAH is the official membership organisation for art historians (across areas of expertise) in the UK, there has been another community with a stronger interest in the application of digital technologies in the creation and study of art. The Computers and the History of Art (CHArt) was established in 1985 in the UK 'to promote interaction between the rapidly developing new IT and the study and practice of Art' (Bentkowska-Kafel 2015, p. 55). It has been an active community of people since the beginning and organised regular conferences to discuss issues of interest. Yet, even though the community was active at the time of the recruitment of our participants and used to distribute our call for interviewees (2013), limited activity was identified near the completion of this thesis (early 2018).[29]

Overall, the range of areas researched by the participants in this study is very much in line with the diversity of expertise reflected in the AAH directory. This variety in areas of research and teaching is a characteristic of art history and a result of its interdisciplinary nature (as discussed in the introduction); yet, factors linked to this characteristic (e.g. variety of information objects, methods) have often been the cause of problems for scholars employing digital technologies for research and teaching.[30] Finally, the different career levels of the interviewees in this thesis (as above and in chapter 4, p. 82) mirror the reality of the profession, where members range from PhD students and academic staff to independent scholars and other professionals (e.g. working in museums). Again, the fact that art history is practiced by junior and senior scholars and professionals across different institutions (sometimes with more than one professional role per person) can have an impact on their information behav-

[28] See http://www.datawareonline.co.uk/aah/Default.aspx?tabid=83. It should be noted that some of the registered members are not based in the UK.

[29] The website seemed to be down and the last conference was held in 2015. The conference information was gained through the CHArt mailing list, https://www.jiscmail.ac.uk/cgi-bin/webadmin?A0=CHART.

[30] These issues will be presented later in this thesis, especially in chapters 5, 6, 7, and 8.

iour, an issue that will occasionally become apparent through the presentation and analysis of our data.[31]

3.2.2.2 Interviewing Process and Observation

After the participants received the information pack with the details of the study and agreed to be interviewed, the more practical aspects of the procedure were discussed. More specifically, these aspects were related to the place of the interview and the possibility of participating in the observation process. Regarding the former, at the time of designing the study, we were particularly interested in interviewing the scholars at the place where they work. This approach would permit the observation of their personal collections, especially when these were in a physical format, and would allow the interviewer to take some pictures when possible. Also, it would be easier for the scholars being interviewed to provide examples of their practices when it was considered necessary. Finally, interviewing scholars in a place familiar to them would facilitate *natural involvement* (as in Rubin and Rubin 1995, pp. 129-131) and would allow the examination of the scholarly practices in their natural context based on an approach that was as unobtrusive as possible.[32] However, following this approach would require conducting face-to-face interviews, which, actually, was the original plan.

As the recruitment phase started, it was necessary to revise the initial plans for two reasons. Firstly, since it was decided to open up the study, due to the initial limited response mentioned earlier, and conduct Skype interviews along with the face-to-face ones, it was not possible to physically be at the place where the participants worked each time. Secondly, during the communication with the scholars prior to the interviews, it became apparent that not every scholar had a permanent space of work, and this was the case principally for junior scholars and PhD students. Also, as in many cases the place scholars worked was their home study, it was not always possible, for personal reasons, to conduct the interview there- a request that had to be respected.

As a result, in order to make it possible for more scholars to participate in the observation process and, thus, follow the initial plan to conduct this secondary method along with the

[31] Relevant issues are presented at a later stage, especially in chapters 5, 6, 7, and 8.

[32] This kind of approach has been frequently employed by scholars studying Arts and Humanities users' behaviour and practices. For example, see Warwick (2012, pp. 3-6).

interviews, it was essential to provide an alternative choice. Therefore, in the case where a scholar was interested in taking part but it was not possible to conduct the observation at their place of work, they were asked to provide images of parts of their personal collections, either the physical or digital ones, which they considered to be important in their daily work routine.[33] We could then discuss these images during the interview at a place arranged to be convenient to the participant; the decision to do the interviews at a place chosen by the participant was made in order to minimise the effect that an unfamiliar environment might have on their behaviour and, ultimately, on the quality of the discussion.

Additionally, it was also ensured that any questions regarding the procedure were covered by keeping frequent communication with the participants before the interview. In most of the cases, however, where the interviews did not take place at the interviewees' workplace, they were conducted at the Department of Information Studies, UCL, as it constituted a convenient and familiar place for many of the scholars. For example, three of the participants based at an Institution outside London were combining other research engagements with the interview, so UCL, located in central London, was a very convenient place for them. Moreover, scholars being interviewed through Skype could also provide images of their collections if they wanted to participate in the observation. As became obvious in practice, providing scholars with the aforementioned option increased the chances of including the observation into the interviewing procedure.

Thus, although slightly altered, it became possible to follow, at least to a satisfying degree, the initial plan with regards to the use of the secondary method in the data collection process. Considering the interviewees, eleven of them agreed to take part in the observation process; nine of them consented to providing pictures of parts of their collections which were either sent by themselves or taken by the interviewer when the interview was conducted face-to-face. Two of the scholars, who took place in the process but did not provide pictures, offered to show some of their files in their collections (digital files in both cases) and discussed their practices. Moreover, when possible, the participants had their chosen material, or part of it, with them during the interview (e.g. on their computer). In total, thirteen of the interviews were face-to-face and seven via Skype. Concerning those conducted face-to-face, three of them took part at the interviewees' workplace; in one case the interview was conducted at the

[33] The images, along with the interview transcripts, can be found at Appendix I, inside the folders of the corresponding participants. Also, some of the images are used during the presentation and analysis of the results of this thesis.

University where the participant worked and in the other two at the home studies of scholars, since these were the places they mostly worked at.

The interviews were recorded with the consent of the participants in all cases. During the face-to-face interviewing, a digital recorder was used (Model: Philips Voice Tracer LFH0602) while the Skype interviews were recorded by using an application called Callnote Premium (Kanda Software)[34] which offers the capability of recording and saving Skype calls. The duration of the recorded interviews ranged from approximately thirty minutes to one hour, but, after adding the time of the conversation that often took place after the official end of the interview or the observation process, the overall interviewing time ranged approximately from forty-five minutes to one hour and fifteen minutes.

For the purpose of recording any parts of the conversation which occurred after the recorder had stopped and that might be of interest to this study, handwritten notes were kept. This practice was considered necessary especially when a participant commented further on something mentioned during the interview, but remembered it after the official part of the interview had ended. Moreover, whenever the observation process was conducted after the recorded part of the interview, handwritten notes were kept as well. In addition, the practice of keeping notes was followed each time after the end of the interviewing process, or as close to the end as possible; it constituted a method for reflecting on the process and recording any thoughts and ideas related to the conversation that had taken place which proved useful particularly at the analysis stage of the study.

As mentioned at an earlier stage, three themes were explored during the interviewing process: information gathering and the creation of personal collections; organisation and management of information; use of personal collections in research and teaching. The first part of the interview was especially important as it allowed the interviewer to get an idea of the types and formats of resources scholars use and to examine whether the choices they make are subject to factors related to their research topic, methodologies or any other aspect. Also, it is should be mentioned that, during this initial part, we were mostly interested in scholarly behaviour related to the gathering of the resources (e.g. in identifying any patterns) rather than looking in detail at the information seeking behaviour of scholars. However, it was necessary to refer to some of the practices involved in the first stages of research, as they

[34] Callnote Premium, http://www.kandasoft.com/home/kanda-apps/skype-call-recorder.html.

could be related to issues affecting other information practices discussed later. Finally, as shown in practice, the interviewees had to mention frequently aspects related to their information seeking behaviour in order to explain any following practices and decisions or to highlight specific points.

The second part of the process focused on the methods employed by scholars in order to record and store as well as label, file, index and organise the information they gather for their research and teaching. Identifying whether the participants followed the same methods when the material was gathered (from any source) and when the material was created by themselves (e.g. reports, thesis chapters etc.) as well as the reasons behind related decisions were also of interest. For that purpose, additional questions concerning the criteria and the reasoning behind specific practices and methods were asked. The final questions regarding that part aimed to explore whether the development of the research process had any particular effect on the information practices discussed as well as to bring into the conversation any problems art historians might face while conducting those practices.

In the third part of the interview scholars were requested to elaborate on issues with regards to the use of their personal collections; the main goal was to explore how the participants used their collections over the period of a research or teaching project. Therefore, they were asked about the frequency with which they added resources to their personal collections as well as the stages of research when they used the collected information most. The last part of the interview focused on the kind of tools scholars would like to have, if there were any, when conducting the various activities discussed during the interview. As a closing point, many of the scholars chose to comment further on what had been mentioned up to that point or refer to other aspects they considered important, such as the future of the art historical discipline.

Although the discussion was structured to some extent, it provided the space for exploring unanticipated but relevant contributions when those arose. Since the experiences of the scholars participating in the study varied, the element of flexibility was especially important to the discussion; for instance, giving scholars the chance to talk about their practices and beliefs by drawing on specific experiences and examples was essential for gaining a better understanding of their behaviour. As a result of this approach, additional questions, not included in the interview guide, were asked when the occasion allowed. In the cases, though,

where the conversation needed to be brought back to the main themes under investigation, the use of the interview guide was considered a good method for achieving that.

Finally, concerning the observation part, this was usually conducted at a point during the interview where it was thought to be more appropriate. Since the intention was to use observation as a secondary method, complementary to interviewing, this approach was considered to be the most suitable and the least intrusive; it gave the interview a more engaging tone while facilitating the purposes of the interview, but often allowed the participants some degree of control as to when they would like the observation to be conducted. Thus, many times the scholars participating in the observation process offered to show specific examples from their collections (e.g. during a visit to the scholar's workspace) or referred to the images they had sent (e.g. in a Skype interview) as examples for supporting their argument during the interview. In other cases, though, participants were asked during a specific point in the conversation to provide an example of their practices, while others preferred to conduct the observation process at the end of the interview. In most cases, the process of the observation was conducted while the recording equipment was in use. So, this part of the conversation was recorded as well which proved very useful during the analysis stage.

3.2.2.3 Limitations

Before completing the presentation of the data collection phase and moving on to the transcription and analysis of the data, we should comment on the limitations imposed by the methods and strategies employed and described above. In particular, given the several issues mentioned earlier- especially those faced during the recruitment of the participants which also led to conducting fewer interviews- and the decisions that had to be taken as a result of these, we cannot claim that the sample is representative of art historians as a whole. It is risky to even claim that the group of scholars gathered and studied for the purposes of this project can be representative of one or more of the scholarly communities inside a diverse field like art history where such a variety of topics are studied and methodologies employed. However, as mentioned in a previous section, the number of participants gathered was appropriate for the purposes of this qualitative study.

The challenges met, though, did not prevent us from founding the decisions made in the context of this project on criteria set by the knowledge of the previous literature, such as

the existing gaps and issues that needed further study, and which were aligned with the goals of this research. Yet, given the time constraints, the literature used for the purposes of this research was limited to studies that were of close interest to it. However, to the best of our knowledge all recent studies regarding the information practices of art historians have been included.

Thinking about the sampling process and the principles used for dividing the participants into two groups, we strongly believe that the approach followed worked best for the purposes of this research. Forming two groups of participants based on more general criteria (traditional and non-traditional research)- though, still based on specific reasons- was appropriate for comparing the practices conducted by the scholars in these groups and, thus, identifying any similarities and differences in terms of their information behaviour. Since there is such diversity of practices even in each of the scholarly communities of the art historical discipline, applying more general criteria and focusing on the basic characteristics of each scholarly group could better facilitate our understanding of the problems scholars faced as well as their needs.

Regarding observation as an additional method to interviewing, since almost half of the participants did not agree to participate in the observation process, the material gained during this part could not be used on its own to draw conclusions on the practices of scholars. However, it should be restated that in this study, observation was used to stimulate conversation and confirm, to some extent, what was being said during the discussion with the purpose of achieving triangulation; for instance observation could balance any problematic aspects of interviewing as a method (e.g. potential preconceptions regarding what is being said during the interview).

Thus, the pictures taken by the interviewer or sent by the participants along with the notes taken after the interviews complemented and, when used during the analysis of the interview data, strengthened the research argument. Using a method like observation as part of the methodology, which has not been employed in previous studies focusing on art history,[35] allowed us to gain a unique insight into the practices of scholars; all in all, we hope that by following the approach and the methods mentioned above, while examining issues not studied

[35] However, an interesting case, and the closest example to this study, where observation was used for examining the collecting and organisational practices of researchers was in the study conducted by Case (1991b).

thoroughly before, this research will contribute with its results to the development of a better understanding of scholarly practices and information behaviour in the field of art history.

3.2.3 After the Fieldwork

3.2.3.1 The Transcription Process

Transcription is a widely used method in qualitative research and it is employed, particularly, by studies collecting language data for analysing conversation and other types of interaction between the people participating in them (e.g. in interviews, focus groups). Yet, there has been great debate over the years with regards to the best approach for transcribing the aforementioned types of data, both from a theoretical and methodological point of view.[36] Generally speaking, the *naturalised* and the *denaturalised* modes are the two most well-known approaches to transcription of qualitative language data (Oliver, Serovich, and Mason 2005, pp. 1273-1274). According to Oliver, Serovich, and Mason (2005, p. 1274) their main difference is the way they perceive language; as the authors noted, the first approach views the language as the 'real world' while the second seeks to find the hidden messages behind it as it considers that '[…] within speech are meanings and perceptions that construct our reality'.

Regarding the approach employed in the current research, the *denaturalised* mode was considered the most appropriate for the purposes of this study while a *verbatim* transcription of the recorded interviews was conducted. The type of verbatim used to accurately transfer the verbal communication into the written format focused on uncovering the meanings behind the language and the content of the conversation than any other aspect of it, such as dialects (e.g. see Oliver, Serovich and Mason 2005, p. 1277). The software used for transcribing the interviews was the Express Scribe Transcription Software.[37]

Concerning the stylistic decisions made during the transcription process, it should be noted that only the parts of speech considered essential for the purposes of our study were

[36] Yet, for anyone interested in the history of transcription as a research method and the various theories, Davidson (2009) provided a detailed review of the literature in the field, beginning from 1979 when transcription matters started to be of consideration until 2009 when her article was published.
[37] Express Scribe Transcription Software, http://www.nch.com.au/scribe/.

kept. More specifically, many of the filler words (e.g. 'you know', 'um', 'like', 'er', 'ah') were omitted, keeping mainly those deemed necessary for the structure and the meaning of a sentence (e.g. when the participant introduced an example by using the word 'like'). Any repeated words and most of the false sentence starts[38] (e.g. when either the interviewer or the interviewee tried to organise their thoughts) were also omitted. Additionally, any non-standard language (e.g. 'cause instead of because) used during speech was altered into its standard format and any grammar and syntactical errors made were corrected when the verbal communication was transferred into the written format; since we were not interested in examining the transcripts from a linguistic perspective, this practice was considered important for improving their reading flow. Finally, regarding any speech overlap occurring during the conversation, the approach taken while transcribing was to first note down the whole sentence of the first speaker and then continue with the other speaker's sentence.

However, in order to ensure that reliability and validity were not compromised, the editing process was conducted in stages. For that purpose, several versions of the transcripts were produced. The first version was an attempt to transcribe the discussion as accurately as possible, while the later versions were edited based on the criteria described previously and the anonymisation criteria presented at the end of this section. Following this practice allowed us to regularly revisit previous versions while working on an edited one, always making sure that, despite the editing process, the transcript was still a faithful depiction of the actual conversation. Finally, and as mentioned earlier, the last stage of the transcription process included the review of the transcripts by the participants for reasons of accuracy and validity; as a result, the documents were sent to the scholars before the final edit.[39] Ten of the participants replied with comments and corrections which were embedded in the last version of the transcripts.

Concerning the format of the transcript, a template was created and a simple system for inserting additional features throughout the text was developed.[40] The template allowed us

[38] By 'false sentence starts' we mean the cases where a person starts a sentence but stops before they finish it and quickly starts another.

[39] Actually, nineteen instead of twenty transcripts were sent, since, unfortunately, one of the participants had passed away by that time.

[40] Both can be found at Appendix II. Also, the criteria for creating them were formed after consulting various resources with suggestions on how to transcribe interview data such as
UK Data Archive, http://www.data-archive.ac.uk/create-manage/format/transcription,
UK Data Archive, http://www.data-archive.ac.uk/create-manage/consent-ethics/anonymisation?index=2 & McLellan et al. (2003).

to keep at the top of each transcript all the necessary information with regards to each interview (e.g. date, place, comments about the process etc.) which proved useful for easily linking each transcript to the corresponding participant and getting a quick overview of the interviewing process. Also, all lines of the transcribed text were numbered for easy reference, if required, at the later stages of the project. The characteristic of the system employed throughout the transcripts' text was the brackets [ ] which constituted a way of adding further information and comments about the interview transcripts; this information was always accompanied by the time feature, making it easier to find the exact point in the recording which corresponded to the comment in the transcript.[41]

Considering the content of the comments, these could be suggesting the point during the interview when major interruptions occurred (e.g. loud background noise preventing us from hearing some words at a specific point during the conversation); signifying the time during the interview when observation started (if conducted during the interview); highlighting any other difficulties faced while transferring speech into the written format (e.g. problems with regards to the spelling of a name of person or place, especially when this was in a language other than English); indicating long pauses during a participant's answer which may have been signs of thought; suggesting that some words had been replaced due to anonymisation reasons. Moreover, in a few cases, comments were made on participants' reactions while answering a question; this approach was followed only when these reactions were clearly apparent (e.g. laughing or raising the voice to highlight a specific word) and only when it could be considered that they attached a specific meaning to the sentence (e.g. finding a practice funny or saying something in an ironic tone).

Finally, after receiving the participants' feedback on the transcripts, many of the problematic parts in the text were corrected and the related comments removed. However, in the cases where an interruption prevented us from hearing clearly one or more words that could be of significance to the meaning of a sentence and the participant could not provide us with a suggestion, the comment remained. The same applied to the cases where we did not receive feedback on the spelling of words, such as names of people, which were an important part of the text and we could not, otherwise, have known the correct version. Regarding situations where it was not possible to distinguish one or more words in a participant's answer but these

[41] The time feature was removed from the brackets in the last version of the transcripts, but it can still be found in the previous versions.

words did not have any significant effect on the meaning of the sentence, they were replaced by others with a similar connotation and followed by the comment *unclear*.

3.2.3.2 Anonymisation

Anonymisation was another important factor taken into consideration during the transcription of the interview data.[42] Firstly, it should be mentioned that all the interviewees were given a Participant ID which consisted of the word Participant and a number based on the order in which each interviewee participated in the interviewing process (e.g. Participant 01 was the ID of the first interviewee and so on). As a result, a document including the full details of each participant was created, which enabled us to easily keep track of the information related to each Participant ID. In addition, after all the recordings were transcribed, we proceeded with the anonymisation of specific parts within the transcripts' text. Having various versions of the transcripts ensured that the changes made in the last version of the text could be easily tracked down by going back to the previous ones.

Therefore, small phrases or words (e.g. names of institutions or people names) which could reveal the interviewees' identity were replaced with more neutral ones (e.g. replacing a participant's institutional name with words such as my institution, the University where I study, and so on) followed by a comment highlighting that a change had taken place. However, before sending the transcripts to the participants for feedback, the suggested parts for anonymisation were highlighted; this practice allowed the interviewees to get a clear view of the steps taken as part of the agreement on anonymity signed by both parties through the consent form and comment on them, if they wished. Finally, after all the participants' comments were embedded in the final version of the transcripts, we were ready to proceed to the analysis stage.

This sub-section concludes the data collection part of this thesis where its different stages were discussed in detail. The initial steps followed before the interviews and the observation were presented; these included the design of the interview guide and the accompanying documents for gaining participant consent along with the details of the pilot study. As part of the second methodological stage, the sampling criteria of this study, the process of conducting

[42] The UK Data Archive's page on best practices for the anonymisation of qualitative data (http://www.data-archive.ac.uk/create-manage/consent-ethics/anonymisation?index=2) was consulted during this process.

the interviews and the observation and the limitations of the study were described in detail. The presentation of the third stage mainly included the process of transcribing the interviews as well as the necessary measures taken in order to secure the anonymisation of the data. Finally, throughout this part, one of the main goals was to clearly stress how achieving reliability and validity was at the core of this study's concern. The next part, closing the methodological discussion, deals with the practices associated with the analysis of the data in this study.

3.3. Data Analysis

According to Gorman and Clayton (2004, p. 206), 'data analysis is the process of bringing order, structure and meaning to the mass of collected data'. Wolcott (1994, p. 24) suggested that data analysis as a broader term includes tasks such as *description*, *analysis* (in a narrower sense), and *interpretation*. However, this process is complex, usually iterative rather than linear, and it can begin at different stages of the research process; for example, the researcher can start thinking about the analysis process even before collecting the data (Marshall and Rossman 2006, p. 154).

Marshall and Rossman (2006, p. 155) argued that the qualitative researcher's approach may be led by initial ideas which are then developed further or change, but, in terms of analysis, their 'overall strategy is closer to the interpretive/subjectivist end of the continuum than the technical/objectivist end'. As data have no meaning when taken out of context, through the interpretive approach, the researcher can convert data into findings. Crabtree and Miller (1992, p. 17) suggested that '[…] nearly as many analysis strategies exist as qualitative researchers'. In fact, there are several techniques used by qualitative researchers with some of the most common being *thematic analysis*, *grounded theory*, *conversation or discourse analysis*, *ethnographic analysis*, and *content analysis*.[43] The choice of technique, though, can be based on various factors such as the study's research questions, the purpose of the study or the data collection technique employed. An interesting observation when considering the above analytical techniques is that the identification of themes, patterns and relationships, even though approached differently, constitutes a common practice.

[43] The reader interested in getting more information on the variety of analytical techniques used in qualitative research can consult resources such as Gorman and Clayton (2004), Charmaz (2006), Braun and Clarke (2006), Bryman (2012) and Berg and Lune (2012), where they can also find extensive bibliographical references.

Generating categories and identifying themes and patterns through close examination of the data are activities that often take place after the initial stages of analysis which involves mainly the *organisation of data* and the *immersion in the data* (Marshall and Rossman 2006, pp. 157-160). During this process, the researcher can follow either a *deductive* or *inductive* approach (Patton 2002, p. 453). A researcher following a deductive approach, or a top-down approach, will use the study's research questions or the framework or theory being followed in order to look for themes and patterns and then compare them. Induction, on the other hand, is a bottom-up approach; it begins from data observation and can lead to theory building while it usually informs, or it is part of, the research design. An example of the latter method of discovering patterns and themes would be grounded theory which looks for theories grounded in the data without using any prefigured analytical framework.

Coding constitutes another common practice amongst qualitative researchers for uncovering any themes existing in the research data. Originating in grounded theory (Suter 2012, p. 352), coding data has become '[…] the formal representation of analytic thinking' (Marshall and Rossman 2006, p. 160). Again, there can be different stages and approaches in terms of coding. During the initial stage of the process, the researcher may engage in activities such as *word-by-word* coding, *line-by-line* coding, coding *incident-to-incident* or generating *in-vivo* codes[44] (Charmaz 2006, pp. 47-57). Strauss and Corbin (1998) referred to this initial phase of coding as *open coding*.

The next stage includes a more *focused* coding of the data where the most important or recurring codes created during the initial phase are used to form the major themes under which the data will be categorised; yet, these main codes need to be selected based on their analytic potential for categorising the rest of the data (Charmaz 2006, pp. 57-60). Another type of coding, then, is the *axial* coding, where the researcher mainly '[…] relates categories to subcategories, specifies the properties and dimensions of a category and reassembles the data […] fractured during initial coding to give coherence to the emerging analysis' (Charmaz 2006, p. 60). At this stage, though, Strauss and Corbin (1998, p. 163) proposed an alternative way of coding, which is *coding for process*. More specifically, instead of looking for properties and dimensions, as described above, the researcher is interested in uncovering ac-

[44] In-vivo codes are usually used by researchers as a method for preserving the original language used by the participant. For instance, if the participant used an interesting term to describe an event, behaviour or experience, the researcher may find it useful to code the data describing what the participant said at that specific point by using that exact term (Charmaz 2006, pp. 55-57). An example of an in-vivo code used in this thesis can be found in Appendix III.

tion/interaction and whether this affects any fundamental conditions over time (Strauss and Corbin 1998, p. 163).

Additionally, *theoretical* coding constitutes a more advanced type of coding which usually comes after focused coding while, according to Glaser (1978, p. 72), the codes created at this stage can represent the relationships between various codes as hypotheses for constructing a theory. This last type of coding also resembles Strauss and Corbin's (1998, p. 143) *selective* coding, which is '[…] the process of integrating and refining the theory'. Finally, as Lincoln and Cuba (1985, p. 350) and Strauss (1987, p. 128) noted, coding comes to an end when all the generated categories and themes become saturated and the issues raised during the analysis of the relationships between them produce results that are of satisfying quality and depth and can be used to answer the study's research questions.

One of the major difficulties faced by researchers employing coding as an analytical tool is their own preconceptions. Charmaz (2006, p. 67) noted that 'every researcher holds preconceptions that influence, but may not determine, what we attend to and how we make sense of it'. Moreover, Strauss argued in 1987 (p. 64) that, especially during the initial stage of data analysis, codes can be created which may be problematic, for example due to lack of research experience or due to biases imposed on them. However, as the coding process progresses, the controversial nature of this kind of codes will soon become apparent since they will probably not fit the emerging coding scheme (Strauss 1987, p. 64).

Thus, suggested practices in order to avoid, to the extent possible, imposing particular standpoints on the data include taking into account problems that may appear when coding, especially when the coding scheme used does not meet specific standards, such as *coding at too general a level*, *coding out of context* or *identifying topics instead of actions and processes* (Charrmaz 2006, p. 69). Also, more general advice relates to comparing across your data, avoiding misinterpreting what the participants said, particularly when the data does not support the researcher's argument, or, in the case where a specific disciplinary framework is followed, constantly questioning whether the contextual framework is helpful for analysing and understanding the research data (Charrmaz 2006, p. 68). Finally, an issue that may constitute a challenge is the fact that 'coding relies on having solid data' (Charmaz 2006, p. 69); in other words, the data collection process can affect the coding and analysis of the data, something that should be taken under consideration early on in the research process.

Memo writing is another practice which is usually associated with coding. As Strauss proposed (1987, p. 8), writing memos should start early on and be conducted in parallel with the coding process.[45] Finally, at the stage where the coding process has progressed and has become more focused, with the aid of memo writing as well, the researcher can begin offering interpretations of the data gathered and the experience of analysing it. At this point, alternative viewpoints associated with the data should be sought, examined and compared against the researcher's interpretations and conclusions; through the process of comparison, the researcher should make sure that they had offered the most suitable interpretation for the collected data (Marshall and Rossman 2006, p. 162). Then, the researcher can proceed to the final step which includes the reporting and sharing of the study's interpretations and conclusions (Rubin and Rubin 1995, pp. 257-274). In the next section, a presentation of the approach employed in the current research regarding data analysis and coding follows.

3.3.1 Coding, Analysing and Interpreting the Interview Data

Data analysis in this study was principally concerned with the identification of themes and patterns of behaviour, especially with regards to the gathering and organisation of information by the art historians who were interviewed. As a result, coding[46] and memo writing were two of the key activities conducted for the analysis of the interview transcripts. Furthermore, for the purpose of coding and analysing the data gathered in this study, the NVivo qualitative software was used.[47] NVivo software is frequently employed by scholars conducting qualitative research, since it enables tasks such as managing data and ideas, creating queries about the data, making visualisations and reporting from the data (Bazeley and Jackson 2013, p. 3).

Firstly, interview transcripts, images, notes and other documents, such as the study's research proposal with the aim, objectives and research questions, were added into NVivo for easy reference during the analysis and, especially, throughout the interpretation stage. Then,

[45] There can be different types of memos, such as *observational*, *methodological*, *thematic*, *theoretical* and *analytic* memos (for example, see Schatzman and Strauss 1973; Rossman and Rallis 2003). In the next subsection of this study, we will focus on the practice of memo writing as a practice which supports analysis and, more specifically, the coding process.

[46] This process resulted in the generation of codes (or tags) through the use of the NVivo software (see Appendix III for examples), enabling the discovery of different themes and patterns throughout the interview data.

[47] More information regarding this software package can be found at http://www.qsrinternational.com/products_nvivo.aspx.

each transcript was coded by using the relevant functions of the software interface. The process took place in two major stages. The first stage included a more general and quicker coding of the broader themes, notions and ideas that could be found in the participants' responses. Thus, this initial kind of coding resembled the open coding described before by Strauss and Corbin (1998). As a result, the process included tagging each paragraph, particular sentences or even words by creating in-vivo codes (see Appendix III). Memo writing at this point constituted a way of recoding description-related information with regards to the codes that were being generated. Following this practice was considered necessary in order to be able to recall at a later stage the reasons a specific code was created or what the properties of a code were at this initial stage of the analysis.

The second stage included a more detailed coding process, focusing more on the relationships and patterns of behaviour in a single transcript and across the data set, resembling the axial coding described by Charmaz (2006, p. 60). For example, factors that could affect and, thus, explain particular practices as well as any relationships between specific information practices and scholarly activities or methodological approaches constituted major points of interest during this stage. At this second stage, important codes were identified in order to form themes that could be used to categorise the rest of the codes (as also in Charmaz 2006, p. 57). As an analytical step, this stage allowed us to work towards the interpretation of the data and was supported by reflective memo writing. The aim of memo writing was to record any essential information in relation to the categories and subcategories of codes as well as any theoretical ideas with regards to the data and connections to the literature in the field.

The approach followed in terms of coding allowed us to look for themes and concepts emerging from the data (or else, open coding) rather than looking for particular codes (or else, close coding) while going through each response provided by the interviewees. There was not one particular scheme followed for the purposes of coding the transcript data. We were aware, though, of the fact that the design of the main data collection method, the interviews, was based on particular research questions; accordingly, it was expected that specific answers would be triggered which, to some extent, would lead to the generation of particular codes. However, since the format of the interview process, which was semi-structured, allowed for unexpected themes and ideas to occur, a coding approach that was more flexible and would allow for the discovery of these unanticipated topics and concepts was deemed more appropriate.

It should be mentioned, that each part of the transcript (paragraph, line, word) that made analytical sense to code could be tagged with as many codes as relevant, particularly during the initial phase of coding. This allowed the data to be coded in various ways, meeting the analytical need for tagging parts of the transcripts that were directly related to the interview questions and, thus, to the study's research questions, but also allowing for unexpected themes to be tagged as well, which could bring unforeseen aspects of the issues explored through the interviews to the fore. Tagging each data part in the above fashion facilitated the more focused stage of the coding process, where relationships and connections between codes in a single transcript and across the data set were sought. During this second major coding stage, the various codes were refined in order to reflect the analytical progress; for example, the descriptions of particular codes were altered or adapted accordingly and codes that were no longer relevant were deleted.

Overall, choosing this approach enabled us to remain open and, thus, avoid any preconceptions being enforced on the data during the coding process. Moreover, and as mentioned above, coding in various ways facilitated the comparison of tags across the data set in the later stage of the analysis; employing this practice also proved useful in the sense that any parts of the data set that may have been incorrectly tagged could be re-visited after a cross-comparison or deleted, reducing the risk of presumptions and misconceptions entering the interpretation stage of the data. Another method employed, as suggested by Charmaz (2006, p. 69), in order to avoid research bias during this process was to code not only topic-related themes, but also process-related and action-related ones. Finally, the language used for the creation of codes, which was based to a great extent on terms used in existing literature (more details below) and the generation of in-vivo codes (see Appendix III)[48] for preserving the interviewee's language when considered necessary, contributed towards this goal.

Regarding the terms from the literature used as the basis for creating some of the codes in this study, they often came from studies related to scholarly practices and information behaviour. In particular, studies such as Palmer, Teffeau and Pirmann's (2009) report on scholarly activities and primitives, Ellis's study in 1993 on the various activities related to information seeking, Meho and Tibbo's (2003) study building on the work conducted by Ellis

[48] An example of an in-vivo code specific to the interview data of this study is the *open access* code; this can be achieved through a specific function of the software which allows the user to click on the desired term or phrase and, through the choices provided in the menu, turn them into a code which can then be used to categorise similar pieces of information.

and Kuhlthau's model (1991) on the cognitive aspects of information seeking constituted some of the basic resources consulted when coding parts of the transcripts that reflected particular practices, concepts and behaviours.[49]

The decision to use principally terms deriving from the existing literature in order to code the transcript data was based on the premise that, by following this strategy, the resulting analysis output could be easily compared with the results produced by previous studies in the field. More specifically, using terms generally accepted as suitable to describe specific processes as a base for the language employed during the coding process meant that the categorisation of the themes, concepts and ideas discovered during the analysis stage could be more easily conducted and the properties of the relevant codes more accurately defined. As stated in the 'Literature Review' chapter, studies such as the above would be used as the framework for interpreting the interview data; so, using language derived from these studies for coding parts of the interview transcripts proved useful at the later stage of the analysis. These language choices concerned mostly terms describing scholarly activities and processes as well as types of behaviour.

However, since during the coding process we were also interested in identifying themes and ideas that were related to particular practices and behaviours, such as factors that could affect or trigger them, studies relating to art historical practice or to the arts and humanities practice, more generally, were consulted in terms of the language used to describe them. For instance, when a participant referred to particular resources they used to find information or to the methods they used, these cases were tagged according to the relevant terms encountered in the existing literature. According to the rationale described above, the literature reviewed for the purposes of this study constituted an important part of the coding process. Also, the research questions upon which this study was built were always present during the coding process, but without defining necessarily the way parts of transcripts would be tagged.

A major part of the codes generated were referring to different issues concerning the research process and teaching in art history. For example, there were codes associated with the various information activities and processes taking place throughout the research process. Thus, there were themes constituting categories,[50] such as *information seeking* or *information*

[49] Some examples considering user behaviour both at the initial and later stages of research include practices related to information seeking, such as *chaining* and *browsing*, along with practices linked to the building of personal collections, such as *gathering*, *organising* and *information managing*.

[50] These are examples of the codes created during the analysis of the interview data. Also, see Appendix III.

organisation which included sub-themes like *criteria*, *barriers* or *people*. Other themes were linked to scholarly practices such as *writing*, *reading* or *publishing* and topics related to the interviewees' work like *research topic*, *working practices* or *tools*. Thus, although the themes were coded as they emerged through the data, using terms that could be found in the relevant literature permitted the efficient comparison of the results of this research with the findings of previous studies. Since this study did not employ a grounded theory approach throughout the research process, but only adopted the coding method which is often associated with it, some themes that emerged were, to some extent, expected as the interview guide was designed to trigger them.

However, some unexpected themes also presented themselves. These concerned issues which were not directly linked to the information practices of art historians, but in many cases influencing scholars' decision making in terms of research and teaching. In these cases, a term best suited to this type of theme was used; these concerned art historical academic practice in general, like *career* or *open access*, as well as the *attitudes* associated to them. After reaching a stage when no more codes could be generated or no more analytical discoveries could be made, the *theoretical saturation* (e.g. Strauss 1987), we proceeded to the interpretation stage. Thus, at this point, the study's research questions as well as the relevant literature were employed in order to interpret the coded data; written memos played a crucial role at this stage. In the following chapters (4-8), the results of this interpretation are presented and discussed in detail.

3.4 Chapter Conclusion

To conclude, this chapter focused on the methodological considerations of this thesis. More specifically, the first part aimed at explaining the choice of methods used in the context of this research, interviewing and observation. For this purpose, drawing on related studies was considered necessary; they also worked as a base upon which the data collection process of this study was designed and executed. Validity and reliability were two additional issues that were raised in this initial part of the methodology chapter; the related section was concerned with the practices conducted at different stages of the research process for meeting these criteria and, therefore, achieving research credibility in this study.

The next part looked more closely at the data collection process by describing the steps taken before collecting the data, such as the design of the interview guide, as well as during and after the fieldwork. Thus, the sampling, interviewing and observation process as well as the procedure followed for transcribing and anonymising the gathered data were discussed in detail. By thoroughly explaining the procedures followed and being transparent about the difficulties met and the limitations of this study, the purpose was, again, to work towards increasing the credibility of this research.

Finally, the last part was concerned with the presentation of the strategy employed mainly for the analysis of the interview data in this study. More specifically, the related literature upon which our approach was based constituted the first part of this section, while the second was devoted to the steps that led to the production of the thesis's results. In the latter case, the coding process through the use of the NVivo software and the interpretation of the data that took place during this stage were described in detail. Knowing the procedure behind the production of the findings in this study will enable the reader to better understand the information that follows in the next chapters, which have as their focus the presentation of the thesis's data and their analysis.

CHAPTER 4: RESEARCH AND TEACHING: PROJECTS, METHODS, INFORMATION

The chapter will focus on the initial stages of an art historical project, such as its early conception and the information objects needed for research and teaching in the field. Since the decision making process taking place prior to the start of a project or during the initial phases can very often influence the information behaviour that follows, exploring aspects of the early stages of scholarly work will enable us to better comprehend many of the practices that follow. This argument can be more easily understood if we consider the way research design (usually done prior to or at the beginning of a project) can affect the rest of the research process; for example, in the methodology chapter, several of the presented studies (e.g. Rubin and Rubin 1995; Bryman 2012; Charmaz 2006) referred to the fact that certain decisions taken at the initial stages of research (e.g. regarding the choice of method and instrument for the data collection) could impact on its later stages (e.g. data analysis).

4.1 Research Projects and Interests

The topics of the participants' research projects concerned issues associated with the various areas of the art historical discipline. Table 1 includes the full list of participants and their main projects as well as information on the career stages of scholars.[51] Regarding the art historians who were considered to conduct traditional research, the subjects of their projects focused on European art and its diverse aspects across a number of different periods; Byzantine, Medieval, 19th century and 20th century art. More specifically, the scholars researching on these projects were interested in exploring a range of issues regarding art from these periods in different regions of Europe. These included patronage of Italian art in the medieval period; the history of a church in Rome with a focus on frescoes; medieval art from the perspective of anatomy images and objects; 19th century arts academic training in Europe and, particularly, in Spain; Islamic architecture of medieval Spain and its reception during the 19th century; sports in modern art in England; performance art in Britain with a focus on Asian

[51] The topics of the participants' projects are descriptive rather than exact titles as in some cases no exact titles were given while, in other cases, they were removed for reasons of anonymisation.

artists; art and fashion in 20th century Berlin; Victorian Sculpture in 19th century Britain; tattooing in British art from 19th century to today; applied arts in 1950s-1960s Britain; manuscripts in the Medieval period.

Regarding the projects of scholars categorised in this study as conducting non-traditional research, the topics under investigation included the creation of guidelines for 3D documentation of material cultural heritage; Venus iconography from the Middle Ages to today; 19th century Japanese painting; illuminated manuscripts in the 16th century; Italian Renaissance with a focus on Raphael; industrial portraiture in Singapore in the 20th century; French art history and theory in 17th century; digital and internet art. Thus, the period range studied by the scholars conducting non-traditional research varies from the Middle Ages up to the present day, while the areas are either related to non-Western art or involve digital practices. Based on the research topics studied by participants in both of the above categories, it becomes evident that the periods of interest overlap to a great extent; however, given the scale of this study,[52] it is difficult to draw any conclusions or identify any tendencies with regards to this issue when comparing the subjects studied in traditional and non-traditional research.

Apart from their main research projects, though, many of the art historians participating in this study had side projects running along with their principal ones. These projects were closely related to the general area of the main research or to their other research, teaching and more general interests. Participant 09, below, explains how their side project is connected with their previous experience and interests both in research and teaching in the areas of art history and digital humanities.

> So, basically, I'm studying manuscript illuminations of liturgical and then, on the side, I have a project which is about a research platform dedicated to illuminated manuscripts. So, I'm kind of feeding this ideal project from my experience as a researcher in illuminated manuscripts. And the thing is that through my relationship with this tutor [name of tutor removed], because I took her courses over a period of three years, I acquired a global knowledge of what are the stakes in digital humanities. [Participant 09]

[52] Also, employing a different methodological approach, such as a quantitative methodology, could be a more suitable way to explore this observation further.

Table 1. Participants' research projects, areas and career stages

Participants	Research Topics (anonymised)	Career Stage
01	Patronage of Italian Art in the Medieval period	PhD Student
02	Guidelines for 3D documentation of material cultural heritage	Lecturer
03	The history of a church in Rome with a focus on frescoes	PhD Student and Tutor (academia)
04	Anatomy images and objects from the Medieval period	PhD Student and Lecturer
05	Arts academic training in Europe and, particularly, in Spain in the 19th century	PhD Student and Art Consultant
06	Venus Iconography from the Middle ages to today	Senior Independent Scholar
07	Islamic architecture of medieval Spain and its reception during the modern times (19th century)	Research Fellow and Lecturer
08	19th century Japanese painting	PhD Student
09	Illuminated manuscripts in the 16th century	PhD Student
10	Italian Renaissance with a focus on Raphael	Senior Independent Scholar
11	Modern Art and Sport in the 20th century	Lecturer
12	Industrial Portraiture in Singapore in the 20th century	PhD Student
13	Performance Art in Britain with a focus on Asian Artists	PhD Student
14	Art and Fashion in 1920s Berlin	PhD Student and Lecturer
15	French art history and theory in 17th century	Senior Independent Scholar/ Professional
16	Victorian sculpture in 19th century Britain	PhD Student
17	Digital and Internet art	Assistant Professor/ Senior Researcher
18	Tattooing in British art from 19th century to today	Lecturer
19	Applied arts in 1950s-1960s Britain	PhD Student
20	Manuscripts in the medieval period	Tutor (academia and museums)

Participant 02 also described the second project they were involved in and which was linked to their general research interests.

> The other one [project] has to do with my general interest in 3D representation of artefacts. I'm trying to bring virtual touch, haptic computing, haptic interfaces into the classroom. I collaborate with haptic interface designers and with the physicists and psycho-physicists who are able to measure people's experience of touch; to express touching in figures, so we can compare how people react, and how we can improve the experience of simulating touch when using haptic interfaces to view and experience virtual artefacts. [Participant 02]

At this point, it is worth commenting on the career stage of the art historians in this study and whether this could have an impact on their information practices. As argued in the methodology chapter (pp. 60-61), the different career levels and multiple roles (also see Table 1) of the research participants reflect the reality of the profession. Yet, although there are areas of information work which were not found to have any connection to the career level or professional role of these art historians (e.g. the preference over printed or digital resources as in p. 141), there were cases where aspects of the research conducted at a specific career level or the circumstances of a professional role influenced the behaviour of scholars. For example, issues around information seeking and gathering, such as the need to collect more information at a later stage of research (as in p. 123), were faced more frequently by PhD level researchers. Moreover, as independent researchers had less institutional support, issues such as the cost of accessing material affected them more than others, making them more reliant on their colleagues' assistance (e.g. see pp. 104-105).

Considering whether the practices of scholars could change as their career progressed, it is not possible to say with certainty as this study was not designed to uncover issues such as this.[53] However, given that our participants often referred to past professional roles and career stages, it can be argued that factors such as previous experience of conducting certain practices played an important role in shaping present and future behaviour (e.g. see pp. 102, 106). In many cases, though, it was not the career level or the professional role that influenced how information and scholarly practices developed over time, but other issues such as colleagues' support (e.g. see p. 164). In the next sections and chapters, whenever relevant, the factors that influence scholarly behaviour, including the career level or professional role, are discussed in more detail.

[53] Studying information behaviour over a long period of time, e.g. in the context of a longitudinal study, would produce more accurate results on this matter.

Finally, it should be noted, that some of the scholars who were examining particular matters across times, places, cultures or disciplinary areas faced challenges, evoked by the complexity of their subject, not met by other scholars who looked, for example, at a topic through the lens of one era. For instance, Participant 02's project on the very current issue of policy making for digital cultural heritage required excellent communication skills as it was based on an international, interdisciplinary collaboration, whereas Participant 07's investigation of a particular issue throughout the centuries and across cultures was demanding in its own right (e.g. in terms of resources needed as it will be shown later).

> My most recent project is a European COST action, so networking activities funded by the European Science Foundation. […] We work towards guidelines for 3D documentation of material culture heritage. So, the action involves specialists from different fields; apart from specialists in 3D scanning and spectral imaging we have museum professionals, art historians. We are trying to understand each other and communicate our needs. [Participant 02]

> So, my PhD, my doctorate work had to do with the Alhambra Palace in the South of Spain in Granada. So, my research continues to focus on cross-cultural encounters, specifically on Western European encounters with Islamic monuments in Spain. […] So, there is a trans-historical provenance within my work which sometimes gets me into trouble because I'm neither the one nor the other, but both. [Participant 07]

The information presented here gives an idea of the wide range of projects and research interests that scholars in this study had which, as argued before, made their categorisation a challenging task. The following sub-section will look at the origins of these interests, attempting to understand the connections to scholars' research at the time of the interviews.

4.1.1 Finding a Subject

As previous researchers in the field have found (e.g. Stam 1997; Challener 1999; Elam 2007; Beaudoin and Brady 2011), scholars' collections often consist of material they have gathered over the years and, thus, contain information objects related to various interests and projects (past and current). Hence, gaining contextual information about scholars' projects at the time of the interviews (e.g. whether they derived from earlier work), in combination with information about the building of scholars personal collections (provided later in this thesis), would potentially contribute to the creation of a more complete picture of the nature of per-

sonal collections (e.g. in terms of types and formats) as well as their role in art historians' work (e.g. the use of collected information across projects).

According to the findings of this study, the prevalent reason art historians chose to do research in the areas mentioned above was their previous professional or academic experience and interest in a particular disciplinary area of art history. This means that many of the participants had either been involved in a similar area professionally before starting their research projects or had conducted studies in an area close to the one they were researching at the time of the interviews. Regarding previous studies in particular, it was common, especially, amongst PhD students or early career scholars to point back to their MA Dissertation's findings, similar research conducted then or to a particular module or course in their educational background that triggered the interest to go forward with their research. The following quotes illustrate how the corresponding participants based their decisions to conduct research on a particular topic or project according to professional background (Participant 19) or previous studies and research (Participants 05).

> This is a subject that's so close to my interests, at my professional interests, on ideas of education through design, because as a professional I've worked in museum education. So, I'm looking at how we use objects to teach people and because I've studied the history of design, design objects in particular are my main concern. [Participant 19]

> And then, when I went to London, I studied at an Art Institute [name of Institute removed], and that was mostly practical information. They've broken it up into four categories; they've broken it up in to furniture, ceramics, Old Masters and modern art. And I was obsessed with how this lost arsenal of skills that artists had at the end of the nineteenth century disappeared a generation later, at the beginning of twentieth century. And so, I wanted to find out what those skills were. [Participant 05]

Other reasons for choosing a particular subject to research on included the interest in a particular geographical area or a specific era; interest in certain methods and approaches which often triggered various research questions; inspiration gained from museum exhibitions, specific artworks and art history books; other personal reasons and interests, e.g. coming from a particular cultural background. Yet, it is necessary to note that most of the times it was a combination of the above reasons that prompted further research activity on a specific area.

Based on an excerpt from the interview with Participant 18, a mixture of factors like personal interests and a module at an undergraduate degree led to further study and, eventually, research in the field of art history.

> On a personal level I've been getting tattooed and so, I was kind of re-investigating my own body and interest in that. Then, I had this amazing module on European cinema which is actually about remakes; it was on European film remade by Hollywood, so I think in that module you find the roots of what I'm really interested in, which is I want to think about popular culture in a serious way. […] And so, this seemed to come out really well and I found serendipitously this incredible Master's course and I thought 'Just a minute, I want to do more of this now'. [Participant 18]

Additionally, Participant 11 explains how knowledge of the previous literature on a particular area as well as an interest in specific artworks can lead to the decision to research on a particular topic.

> I think, some of the time it's that you see a gap in the literature and you look around and you think 'Well, I can write that'. I mean, that's the case with the sports thing. […] So, that's one thing. But other things, like particular pieces interest me a lot. I mean, I've written quite a lot on Jacob Epstein's 'Rock Drill' and it's not a piece of work that I would ever say I loved. It wouldn't be in my top three pieces of work or something like that, but there's something fascinating about it that keeps me coming back to writing about that. So, some of the times it's the work and some of the times it's finding gaps. [Participant 11]

Apart from the engaging stories on the ways they became interested in their research projects, some of the interviewees shared the reasons why they got involved in art history in general. This applied mostly on the occasions where the interviewees had previously studied or had been professionally active in another field and decided, at some point, to shift to art history. As will become evident in the following sections, personal collections could be one of the areas of research where scholars in this study applied the knowledge they had acquired and the skills they had developed during their previous work (e.g. technical skills). Thus, information about the professional background of scholars could increase our understanding of certain decisions made when gathering and managing information.

Therefore, it is pertinent to observe that in these cases, visiting museums and a longstanding interest in art were two of the primary reasons for developing an initial interest

which later turned into professional involvement in the field. For example, Participant 10 described how they got interested in art history and how, despite studying sciences, finally decided to make the shift in 2009.

> When I was nine years old I found a copy of Panofsky's 'Meaning in the Visual Arts' on the ground near my house and started to look at this book. I was too young to really understand what was being said in it, but I quite enjoyed the pictures in it. I quite clearly remember seeing a print of Dürer's 'Melancholia I' in that book and over the years I continued to go back to that book and probably when I was in my late teens I was old enough to understand what was in it. In high school I was actually quite fortunate and went to a high school where they actually taught art history for four years. […] So, I was able to study the art history courses. Yes. After that I went into a science related degree and joined the workforce and was mainly keeping up with art history just from reading books and journal articles. But I didn't really get back into it until I started my blog in 2009. And that's the story in a nutshell. [Participant 10]

Also, Participant 09 describes how their relationship with art history began at an early age after a visit to the National Gallery in London.

> Actually, my relationship with art history began in London, in the National Gallery, in 1998. I just became completely engrossed and I still remember buying this huge Atlas of Art History back in 1998. It's just that in 2000, during the final [high school] exams, I had to decide what I was going to do and, at the time, I was not really convinced that you could build a career with art history. […] And then I just decided to go for it and change directions. This is why when I had to decide about my MA, art history finally dominated my choice; because it was a conscious choice and it was a big dream that I could not let go. [Participant 09]

Overall, this sub-section provided important contextual information on this study's art historians' projects and interests which is important not only for understanding the initial phases of a project, but also for creating potential links between their background and scholars' information behaviour at a later stage of this thesis. Next, the objects of study in the participants' projects will be presented and discussed.

4.1.2 Objects of Study

Considering the actual objects of study, these varied widely. According to the findings of this research, at the core of the participants' projects could be artworks (conventional or digital), such as paintings, sculpture, online games (regarded as art) as well as other objects of art, design and material culture; other visual forms of representation (conventional or digital, two-dimensional or three-dimensional), e.g. frescoes, photographs, digital visual surrogates,[54] multispectral images, 3D computer models and graphics which could have as their subject art objects, people, concepts or themes; monuments, such as churches, palaces and mosques; historical, sociocultural, philosophical and other aspects with regards to a particular art matter (e.g. arts education); collections (personal or institutional); manuscripts; artists or other people related to art, such as patrons, and theorists.

Regarding especially the digital visual surrogates as the main (or part of the) object of study, this occurred particularly when the building (actual or conceptual) of a digital database or platform- containing, for example, images of artworks, art objects or manuscripts- constituted the goal (or part of the goal) of the project. In these cases, although the physical object was taken into consideration when appropriate, the digital surrogate constituted not only an information object, but an actual object of study. For example, Participant 06, employing a quantitative approach in art history, collected images (digital or digitised) under the theme of Venus for the purpose of firstly creating a digital database which, then, based on the particular framework of their project, led to the compilation of their Topical Catalogues in digital and printed format.

> I collect everything about the pictures of Venus. I'm not looking for the quality. It's the quantity which is my objective. […] The major activity is their compilation into the Topical Catalogues. Collection isn't a kind of intellectual activity. […] The intellectual activity is categorising into what I call topics. [Participant 06]

Considering the side project Participant 09 had at the time of the interview, this focused on the creation of an 'ideal' digital platform with all the necessary features a resource on illuminated manuscripts should offer. The idea was based on previous research which involved the evaluation of digital images of a specific manuscript.

[54] Baca (2002) used the term visual surrogates to describe photographs, slides or digital images.

> And so, my second MA was about the Farnese Hours which is a manuscript at the Morgan, a very famous manuscript, which is digitised and it is online. It's accessible. One of the first things that I observed on the website of the Morgan was that the manuscript was treated in a very, very weird way. You only had the decorated pages. You did not have the entire book. They provided you with full page illumination, but, then, they would give you details that were preselected; like you only had the right to have a detailed image of the upper part. These couple of observations was the stepping stone for writing one first paper about illuminated manuscripts resources online and proposing a sort of an ideal platform combined with principles of good practice about illuminated manuscripts. [Participant 09]

According to these observations, the digital visual surrogate is something more than an object which provides essential information when the original and, often, physical object of study is difficult to access.[55] In the case of these projects, it is examined and evaluated and, thus, becomes an important part of the study, contributing towards its final goal. This issue concludes the brief overview of the objects of study in the participants' projects and it will be succeeded by an introduction to the research methods employed to examine them.

4.1.3 Research Methods

Concerning the methods[56] the participants employed for researching on their chosen topics, these included historical investigation, archival research, classification and iconography,[57] stylistic analysis,[58] theoretical and philosophical analysis, interviewing, evaluation of digital resources or objects in the field as well as a quantitative approach to art history and quantitative methods, like surveys. However, in the context of this research, it was beyond the scope to discuss in detail any particular methodological concerns scholars had, the rationale behind the approaches they followed or their research questions. In some cases, given the

[55] This has often been the case in previous literature in the field, along with a strong distinction between the physical object and its visual surrogates (e.g. see Promey and Stewart 1997, p. 40; Durran 1997, p. 2).

[56] The purpose of this study does not include a detailed presentation of the methods employed in the field of art history. Yet, a brief discussion on related issues, based on the findings of this project, will follow.

[57] Based on Prown (1982, pp. 7-8) and Bakewell, Beeman and Reese (1988, pp. 143-151), iconography is one of the most common methods employed in the field of art history for the analysis of artworks; its key characteristic is the description of the content (e.g. the theme) of an artwork.

[58] The main practice when conducting stylistic analysis is the comparison between artworks. For more details on this art historical method see Prown (1982, pp. 11-12) and Bakewell, Beeman and Reese (1988, pp. 134-138). Stylistic analysis is also a method, which according to McClung Fleming (1974, p. 157) belongs to the *evaluation phase* of the artefact study which follows, and is strongly related to, the initial stage of identification.

semi-structured format of the interviews and the observation used as a tool to trigger conversation, the discussion was directed to relevant matters. As mentioned previously, in this study, the interview questions around the research topic of the participants constituted part of the introductory section with the aim of enabling participants to feel confident in their role as interviewees and gaining basic information about their projects that could be used to make connections with the activity of collection building. Thus, it is not possible to give a detailed and complete picture of the interviewees' methodological approaches and considerations.

However, based on our findings, some interesting observations regarding method-related issues were made. For example, it was not uncommon to employ traditional methods for researching and understanding the object(s) of study in the context of a digital project. However, it should be noted that in many of the cases where a project involved digital practices, the creation of a digital database, digital platform or digital object (e.g. computer-generated imagery) was a necessary stage in the methodology. Moreover, a combination of methods was often considered appropriate in order to examine the diverse aspects of a topic. As Participant 02 stated, the methods chosen for looking at a particular issue may include both traditional and digital techniques while, for the projects they were involved in at the time, the creation of digital objects was an essential step in their methodological approach.

> Any method, either traditional or digital is always of interest. It's hardly ever one specific method, one specific technology; it's the combination, the different approaches. […] And in all collaborative projects, the project generates the imagery I will be working on, whether this is a 3-dimensional computer model developed by my colleagues here [working place name removed] or as in the case of the COST [exact project title removed] action, multispectral imaging. […] It's generally computer graphics, so in iconographical research, this will be, for example, pattern recognition which I can combine with more traditional classification and iconographical analysis. [Participant 02]

As highlighted before, it is difficult to argue that no other method was used apart from those listed above. Despite eliciting through the discussion the information necessary for this research, as the amount of it differed in each case, it might be likely that additional methods were employed which cannot be fathomed, for instance, by the description of a topic and the general approach followed. Since many of the participants also had side projects which were very briefly mentioned and not discussed in detail, it is not possible to know whether methods like connoisseurship, iconology, semiotics or structuralism were used or to know the particu-

lars of an applied theoretical framework.[59] Yet, given that this aspect of scholars' research was not intended to be examined, it did not have an impact on the interpretation of the data, which were sufficient for answering the research questions of this project.

4.2 Teaching Projects and Interests

Art historians' personal information collections are built to support not only research but also teaching; getting to know the areas where participants were teaching at the time or their teaching interests will help us better understand certain decisions they made (presented later) around information seeking, use and management (e.g. when choosing resources to use or organising parts of their collections according to their teaching activity). Thus, considering participants' teaching responsibilities and the subjects of the modules, the material taught was related to periods of art ranging from the ancient times to today. The time span was much broader than their research projects; this can be easily justified if we consider, for example, the amount of information that needs to be taught in a module at an undergraduate level, which will normally be of a more general scope compared to the very specific nature of a research topic. It is worthwhile mentioning that three out of the fifteen art historians who were teaching at the time of the interviews or were about to start teaching taught at more than one institution, either academic or cultural (e.g. museums). Finally, the format of the modules and courses taught included academic lectures as well as summer schools, short courses and other seminar type courses.

[59] Regarding connoisseurship, McClung Fleming (1974, p. 157) linked it to the identification and evaluation of an artefact and it has strongly to do with the experience of a scholar. On the other hand, iconology and semiotics are related to a great extent and constitute the tools for interpreting any symbols and unravelling meanings hidden in the artworks; together with structuralism, they are used by scholars to discover any relations between artworks which are not obvious at first sight (Bakewell, Beeman and Reese 1988, pp. 140-143; Prown 1982, p. 12).

Table 2. Participants' teaching responsibilities

Participants	Teaching Areas	Level
01	N/A	
02	Digital art, visual culture and cultural heritage	MA
03	Ancient to renaissance art	Mostly continuing education
04	Medieval art	BA and MA
05	N/A	
06	N/A	
07	Medieval and early modern architecture and introductory courses	BA and MA
08	No available information on particular area, probably in the general area of research and introductory courses	BA
09	Digital resource management and introductory courses	BA and, possibly, MA
10	N/A	
11	Modern Art	MA
12	Contemporary visualisation, possibly in South-East Asian art	BA and MA
13	Visual culture and non-Western art	MA
14	Contextual Studies, general and cultural theory, and visual culture	BA
15	Renaissance to modern art (taught a module on Art and American museums at the time of the interviews)	No information on level available
16	N/A	
17	Introductory courses, contemporary art, skills development courses, practice-based work	BA and PhD
18	Contemporary art (Post-war European and American art), Historiography, Non-Western art, performance and digital new media art	BA
19	Research methods	No information on level available
20	Medieval art	BA and continuing education

Table 2 includes information about each participant's teaching responsibilities at the time. The areas which scholars were teaching at the time of the interviews, or were about to start teaching, or considered them to be amongst the areas of interest with regards to teaching

included ancient art; medieval art and architecture; renaissance art; Japanese, Asian and non-Western art; modern art; contemporary art and historiography; performance art; contextual studies; general and cultural theory; digital art, visual culture and cultural heritage; digital resource management; research methods and skills development; practice-based work. Furthermore, the type of the art history modules participants taught were either introductory or more specialised in terms of content, while the levels of students could be undergraduate, Masters, PhD and continuing education.

The selected quotes from the interviews that follow illustrate the variety in the types of courses taught as well as scholars' interests with regards to teaching. For example, Participant 03 based the choice of educational level on previous personal experience and background while Participant 17 highlights their personal interests and preferences when talking about teaching.

> So, I teach, really, mostly continuing education students. I teach at a College in London [name of College removed] and at an art museum in London where I lecture in their early medieval course. I teach at the Institute in London where I got my MA [name of Institute removed], I do a summer school [name of school removed] and I do a study tour to Rome each year. And then I teach at the University I am based now [name of University removed] where I do residential weekend courses. I just got a certificate course next year, but I also do weekend courses on whatever they will ask me basically. I enjoy the teaching, I like doing the teaching. I've chosen to do continuing education because this is how I came into art history. Because I was actually a scientist before that and then I moved into art history. [Participant 03]

> So, at the moment, I'm teaching an introductory course in contemporary art [name of course removed] and, as I say, that's an introduction. It's for students who haven't studied the Arts at all before. […] And I have another project [name of project removed], an online resource on academic publishing and writing and we run a month, in November, in academic writing. So, I also teach this semester writing skills for PhD students and next semester, as part of the studio course, I will be teaching a component [name of component removed] that is practice-based work. So, although I'm an art historian, I try and incorporate as much creativity and actual hands-on making as I can in everything that I work on. [Participant 17]

Finally, the goal of this sub-section was to present our research data related to the teaching responsibilities of the art historians taking part in this research, such as the variety of courses taught and the reasons for preferring teaching in a particular area or level. This infor-

mation, along with the data related to the interviewees' research projects, will prove valuable when looking at their information seeking, use and management practices at a later stage of this thesis. The following discussion will evolve around the types and formats of information objects gathered by the participants as well as the ways these were discovered.

4.3 Information Objects

To begin with, it is essential to present the information objects[60] needed in the context of the research and teaching projects scholars had at the time. These comprised primary and secondary resources which could be either in conventional or digital format and included textual, visual, audio-visual or multimedia material. Considering the textual types of information, they generally included journal articles, books, monographs, magazines, newspapers, manuscripts, archival material, such as correspondence or genealogical records, legal documents, like wills, reports and conference proceedings, photocopies, notes and bibliographic references, and mailing lists.

Thinking about the visual, audio-visual and multimedia material usually employed for the purposes of a research project, it encompassed both two and three dimensional material like photographs in conventional formats, slides (35mm transparencies), digital visual surrogates of various kinds of artworks, other art objects, illustrated manuscripts, (parts of) monuments (e.g. frescoes in churches) and technical details (e.g. floor plans), illustrated catalogues, books and other printed resources containing images, e.g. illustrated magazines, computer graphics, 3D models and multispectral images, video and audio data. Other types of information objects and material in microforms, such as microfilm, were less used.

Regarding this project's findings in relation to the types and formats of the information objects utilised by art historians, in general, they are to a great extent similar to those from previous studies (e.g. see Reed 1992, pp. 734-735; Rose 2002, p. 37). Since some of the interviewees participating in this study were conducting non-traditional research, non-common types of information objects appeared, such as computer graphics, mailing lists, internet artworks or Japanese hand-scrolls which may raise different issues and requirements

[60] An information object in the context of scholarly research is any resource which provides necessary information for understanding the object of study and, thus, achieving the goals of a research project.

when comparing to those more traditionally employed. As for the chronology of the information objects used by the art historians in this research, they could come almost from any time period and from different cultures.

Although it is difficult to know the exact date range for the types of information objects consulted in the context of a study (it did not constitute part of our goal), based on the topics and interests of our interviewees, these could range from ancient times to today. Since the art historical discipline is a broad field of study with many sub-areas dealing with every aspect of art across human history, it is usual for scholars to utilise types of information from different eras even in the context of a single project; for example, according to Reed (1992, p. 734), some of the most important texts in the field which are consulted by scholars from many sub-disciplinary areas date back to the 16th century (e.g. *The Lives of the Artists* by Giorgio Vasari).

Continuing, most of the above information objects also constituted the material that made up the personal collections of the scholars, while many of these were used for teaching purposes as well. The variety of information objects used for the purposes of research and teaching is also illustrated by the sample excerpts below from the interviews conducted with Participant 01 and Participant 20; the interviewees were asked about the types and formats of material they used in the context of their projects.

> Visual, secondary resources and a lot of archival resources. [Participant 01]

> I use a variety of resources; you can see from the books that I have around in my study that I have quite a lot of hard copy material. Increasingly, particularly since I moved from slides to PowerPoints, I use digital material too. And, also, I suppose I use primary sources in a sense that I often visit somewhere that I'm going to be teaching to take digital images which I then use for teaching purposes. So, quite a broad variety of resources. [Participant 20]

However, the diversity of resources utilised for research and teaching in the field of art history was something that, to a large extent, was expected. Nevertheless, there are several issues with regards to this finding that are worthwhile exploring further. Firstly, it should be highlighted that the original artworks and other objects of study in their original form (e.g. monuments, manuscripts, Japanese hand-scrolls), the primary resources, such as archival material, and visual surrogates (physical or digital) were the information objects with the greatest significance for these scholars, confirming in that way several earlier studies whose

findings were presented in the literature review chapter (e.g. Bakewell, Beeman and Reese 1988; Beeman 1995; Durran 1997; Beaudoin 2005). For instance, as Participant 04 clearly explained, an art object or an image could provide the inspiration for kick-starting the actual research on a project.[61]

> Personally, I tend to start with objects or images. So, an interest will often be sprung by looking at an image- often online just because it's easy to access- either in an image library or normally a museum website. And then if it's in a museum environment I'm going to see it. Actually, often, I mainly just rely on images- which is probably bad art history, but it's helpful because they are often not on show or access. And then, I guess, I'll go to a library and try and learn more about it through books. [Participant 04]

This quote brings to mind Makri and Warwick's (2010, p. 1758) finding about the inspirational effect that information had on the work of the postgraduate architecture students in their study; more specifically, as in this study, information found online triggered new ideas for current and future projects. Given that Makri and Warwick employed Shneiderman's *Genex framework* (2000, pp. 119-124) for understanding the information behaviour of this group of users conducting creative work, art historians' similar creative behaviour here suggests that this model can be relevant for examining their practices as well.

Regarding, though, the original object and its visual surrogates, there was still a strong preference for the physical object. According to Participant 08, seeing the actual object, even when related digital images are available, is considered essential.

> Thanks to digitisation, these images are becoming accessible. But on the other hand, it's hard to think they are equal. Digitised images are never as good as looking at the original or handling the original. So, I think it will always be necessary to look at the real painting and not just at the image. It's a little bit difficult to just rely on the digitised images [laughs]. [Participant 08]

Actually, this is related to Participant's 04 previous observation that starting from visual surrogates is 'probably bad art history', which has largely to do with academic training in art history and the key role artworks have always played in scholarly research in the field. Thus, it comes as no surprise that many of the scholars in this project chose to travel across countries- and often more than once- in order to visit the artworks they were studying. The

[61] The participant in this case refers to the fact that they frequently begin their research with images since they are often available online.

importance of seeing the physical object becomes also obvious in an extract from Participant 11's interview for two reasons; firstly, as in the case of Participant 04, having seen an art object may be the reason for starting a project (on this occasion, a piece of writing) and, secondly, there are some times when an object, seen up close, may seem different from its visual surrogate (physical or digital).

> Quite often I'm writing about works that I have seen in the flesh; I wrote an essay on paintings of cyclists in 1913 and 1914. […] Two of those works were in Venice and I was writing about one of them in a lot of detail and I thought 'This is kind of silly now. I have to go to Venice to see the paintings'. So, I did go to Venice just to see these two paintings. […] Some things look exactly the same as they do in books, and that was the case with one of the paintings in Venice, but then the other painting in Venice, a work by Metzinger, just looked completely different. I don't know, it's just all these things about it that I never [emphasized] would have noticed if I just worked from the book as well. So, where possible, if it's a major work, I'll go and see it even if it's in another country, but obviously that's not always possible. [Participant 11]

In another case, Participant 16, when asked about the visual material they used, made a comment on the effects of digitisation which might as well be considered an additional reason why scholars sometimes need to see the original material 'in the flesh'.

> Printed photographs in secondary material; so modern photographic reproductions, engravings in nineteenth century periodicals or books which I usually see them digitised to begin with, which can be a problem because one digitisation project makes it look entirely different from another, or I see them in the flesh. [Participant 16]

Yet, the distinction between the artwork and its visual surrogates may be stronger when a project is concerned with a physical object(s). In the case of a digital art project where the object of study is born digital (e.g. computer graphics, as in the case of Participant 02) or when the actual object is lost or inaccessible, priorities often differ. More specifically, under these circumstances, the digital object (created or gathered) or visual surrogate (digital or analogue) constitute either the object of study (or part of it) or the primary material, becoming one of the main information objects which are necessary for answering the research questions of the study. As a result, in the former case, the digital object plays a key role in the research project and, regardless of having a physical equivalent or not, it is regarded as a valuable resource which can offer answers to questions that cannot be provided by the physical object

alone. In the latter case, the value of the visual surrogate increases and its use as a key information object becomes an acceptable practice in art historical research (e.g. see Bakewell, Beeman and Reese 1988, pp. 14-15). Moreover, although seeing in person the art objects that constitute the core of a scholar's project may be important, it is not always possible and, thus, visual surrogates can be a satisfactory solution when circumstances do not allow for a visit to see the physical object.

It is worthwhile mentioning also that travelling was considered necessary in order to visit other primary resources. Therefore, during these travels, art historians usually took photographs of the resources, artworks, art objects, or monuments they were visiting. Participant 05's story below confirms the degree of significance that 'taking your own photographs' can have in art history, showing that scholars had often to go to extra effort in order to be able to photograph the material needed for their study.

> My study has been mainly original sources, only occasionally looking at secondary sources. There isn't a great deal of material written about the artists of this period, so I've had to go directly to the documents that are related to them. […] In the 1940s, there was an aggressive decentralisation; so, I would go to one archive that was the main archive they were supposed to be in- and it was in an art archive [name of archive removed] in Madrid- and the archivist who was in charge of that was very protective of the documents. […] She would say that I couldn't make any photocopies to, say, photographs or anything; all I could do was to go there and handwrite everything. So what I would do is to find one of the people who worked there who was basically a janitor and I would pay him under the table to photocopy for me. [Participant 05]

As in the case of Participant 05, the main reasons for travelling to take photographs- principally, but not only- of primary resources included the fact that parts of the material needed was often either not digitised or inaccessible online; the low quality of digital images available on the Web regarding particular areas of study; the fact that, many times, images available online were not useful to researchers as they did not meet the criteria posed by their research project. For example, Participant 03 explained why they preferred taking their own photographs than using the ones available on the Web.

> The problem is that you often want bits that aren't necessarily attractive pictures. The pictures [the frescoes] in this church are very beautiful in many ways but are often very damaged. So, you often need to look at them from all sorts of sides, look to see the layers and so on. So, what I use as

> my main resource is the pictures I've taken from going there and being able to take them. [Participant 03]

Finally, it should be noted that, while analysing the data concerning the material scholars needed in the context of their projects, several issues associated to information discovery and access started to surface which we will have the chance to discuss in the following chapter.

4.4 Findings Summary

This part of the thesis focused on the introduction of the interviewees' projects and interests in relation to research and teaching as well as the types and formats of information they utilised in their work. Thus, we learnt about the topics and objects of study of the participants conducting traditional and non-traditional research as well as the methods they employed and got a glimpse of the challenges associated with some types of work, such as interdisciplinary research. Regarding the reasons behind the choice of topics, previous experience in an area of study or a combination of factors (e.g. interest in a specific era or method) usually influenced scholars' decisions when embarking on a new project.

Moreover, the variety of activities, including teaching and side projects, led by art historians in this study reflect the reality of the field where scholars have different professional roles and, accordingly, complex information behaviours and needs. Hence, the diversity of information objects used by the participants in research and teaching was an anticipated finding; yet, compared to previous literature, it became apparent that new types of information objects have started to emerge (e.g. multispectral images, 3D computer models and graphics). Apart from that, the significance of the original artwork for scholars and its ability to inspire them were undeniable; however, visual surrogates could play an important role in the context of specific areas of study (e.g. digital research) or in the cases where the original object was inaccessible or lost. Lastly, it should be mentioned that many of the interviewees had to travel to access information (especially primary material) that was not digitised or of unsatisfactory quality digitally.

Thinking about career levels and the impact these could have on information work, it was noted that art historians at specific career stages or professional roles (e.g. PhD level or independent scholars) could face challenges that others would not, such as during information

seeking and access. Yet, it was argued that it was often other factors (e.g. colleagues), and not career stages or choices, that could influence the development of practices over a period of time. This information constitutes the framework within which we aim to explore the participants' information seeking and organisation behaviour in the following chapters; being familiar with details around their career, work and interests will enable us to discern more easily the motives behind their decision making process when interacting with information and understand their needs.

CHAPTER 5: INFORMATION SEEKING BEHAVIOUR: CRITERIA, PLACES, PRACTICES

In this chapter we present and analyse the research data concerning scholars' criteria for choosing resources, their information seeking practices as well as the places where they looked for information. In addition, the problems art historians in this study faced when attempting to find specific information along with their concerns about different aspects of this process will be part of the discussion. Understanding some of the basic issues related to the stage prior to the building of personal research collections is necessary before examining the practices and needs involved in the gathering, organisation, use and management of information; this knowledge will prove useful later, when drawing links between the behaviour, needs and challenges before, during and after the practice of collection building.

5.1 Criteria for Choosing Resources

An interesting aspect of the findings related to the places that scholars visited for finding information was why they preferred certain resources over others. Convenience was one of the factors that influenced their decisions with regards to which places to visit and it was often associated with easy access to digital and physical resources provided by the places where the scholars worked or studied. This was the case especially when these places had libraries- mainly institutional libraries- with a rich variety of resources and facilities. These libraries and their online catalogues were one of the first choices when looking for information in the context of a research or teaching project. As can be seen in the extract below, one of the main resources used was the library where the participant was based at the time of the interview while the other was where their object of study (a church) was located.

> I mean, I am very lucky with the place where I am based now [name of place removed] because the University Library is fantastic. And the British School in Rome has a wonderful library. So, those are my main resources. I use the Warburg very little, because, actually, almost everything is in the Library at the place where I am currently based [name of place removed] or Rome and I tend to use those sources. [Participant 03]

On the other hand, and particularly when the place where they were based did not offer a good variety of resources, scholars tended to visit other places which were either geographically close to them or were considered worth visiting for particular reasons. In the latter case, the most common reason was the degree to which the material that could be found at a specific library, museum or archive (physically or digitally) was relevant to the topic researched or taught; as will also become clearer later in this chapter, this knowledge was gained either by first searching online, by previous experience, or through colleagues' and other peoples' recommendations. Participant 04, for example, who was researching a topic that had a medical aspect into it, chose the Wellcome Collection Library as one of their main libraries, while Participant 20, based on the subject taught and on previous experience, knew which resource to consult when required.

> So, recently, because, obviously, my subject is medical, I had to deal with a lot of medical journals, like The Lancet or Speculum- it is, I suppose, a medieval journal, but it's got medical advice. Actually, I use the Wellcome Collection Library a lot. It's a really good library. I really like it there. [Participant 04]

> Well, for text it would depend on the subject that I'm teaching and the angle which I'm coming to it from. And if it's a subject that I am relatively unfamiliar with, I suppose I'm at a point in my career where for certain things I can pull together a lecture without doing an immense amount of new reading because it's all in my head. But if it's something new, I would go to JSTOR, search for articles, print them out, read them and that will inform the structure that I'm drafting textually first of all. And I suppose I will know what is used and what isn't as I shift through the content. [Participant 20]

As Participant 20's further comments demonstrate, the issue of turning to a personal collection which has been built upon personal criteria over the years and which is easily accessible emerges as one of the choices when considering starting to look for information, particularly when other resources do not meet specific information needs.

> And I have my own digital database of visual material now which is culled from a variety of different sources, both online resources and images that I scanned using my scanner from printed material and images that I downloaded from my digital camera that I take with me when I'm taking images. [Participant 20]

Considering artworks as objects of study, though, it is worthwhile noting that, based on the excerpts from the interviews with Participants 14 and 20, they could dictate the material

needed for research or teaching and, in a way, the resources to be visited and used; actually, these scholars' accounts showcase once more the importance that starting research from the art object, in its broader sense, has in art historical practice. Thus, based on their disciplinary training, scholars would start from the art object or get inspired by it (as also argued in the 'Information Objects' section) and move on by choosing relevant sources that could help them understand their topic better. Also, according to Participant 03, employing a specific method could have a similar effect.[62]

> And because I saw the connections, I decided I could do this topic and, depending on which paintings I researched, this summer I went to five different archives and libraries in different places in Germany. I went to an archive for this artist which is one by his granddaughter, so lots of different locations and lots of different mediums; whether that's fashion magazines to books about the artist to newspaper reports about the artist's exhibition in the 20's [1920s]. [Participant 14]

> The material comes first. I think because I've been trained in this London Institute [name of Institute removed], I proceed in quite an empirical way. So the material I'm teaching will dictate the content of a lecture which in turn will dictate which resources I have to access in order to acquire the material I need, if that makes sense. […] So I don't start with the resources. I start with the object or the monuments that I'm teaching. [Participant 20]

> The Princeton Christian website which I used to access from the Institute in London where I got my MA [name of Institute removed] is quite good. […] And you can go into that and then you get a list of all the images that they've got and you can go through them. So, if I was looking to particular iconography, which I once I did, I did use Princeton Christian website. But I do tend to just search and see what comes up. [Participant 03]

Yet, knowing where to go to find information that is relevant to one's topic did not necessarily mean that the process to access it was easy- as also seen in the account of Participant 05 earlier- or the place conveniently located. More specifically, travelling was a choice many had to make for consulting secondary resources as well. Participant 08, who was researching 19th century Japanese painting, had, amongst other places, to visit Japan, since part of the information needed was not accessible in any other way.

[62] However, given the fact that the discussion only occasionally developed around research methodologies and their relation to information practices, we cannot claim with certainty that a scholar employing a particular methodology will choose to use specific resources.

> And so, I've got all of that in Japan because it's very hard to get those books here. […] I'm reading as well manuscripts, handwritten books, as a sort of social context. [Participant 08]

This issue generates questions regarding the extent to which information resources available online, even when talking about secondary resources, meet the needs of scholars in the various sub-disciplinary areas of art history, like non-Western art. Although it is difficult to draw firm conclusions in terms of this matter,[63] during the analysis of interviews, it became apparent that some areas in the field of art history benefitted from greater availability of resources than others.

More specifically, the art period a project was looking at, the geographical focus of its subject (e.g. non-Western art) or the fact that the topic under investigation may have not been researched before were often connected to issues of availability of resources, conveniently accessible to scholars. The following quote from the interview with Participant 05, when compared to that by Participant 08 above, illustrates the argument with regards to the availability of resources for scholars researching on particular topics (e.g. 19th century European art compared to Non-Western art).

> Google Books is very helpful to me because there're a lot of things specifically from my period in there. So, it's very good for me to have access to them. […] So, I find myself spending hours and hours reading Spanish newspapers which are fully digitised and searchable. [Participant 05]

Continuing, other factors mentioned by this study's participants for choosing certain resources and material over other included accessibility, especially in relevance to cost (due to travel or copyright issues); language; breadth and quality of material; reliability of source. Accessibility was mentioned beforehand in relation to convenience; yet, in the case of Participant 10 below, it is linked to cost that occurs from accessing specific resources.

> The primary factor for me was firstly its accessibility, how easy or hard would be to get, how much it would cost, the language it was in and whether I understood that language or some of my colleagues were able to assist me with that. [Participant 10]

[63] It was not the purpose of the study to collect the details of all the information resources scholars used so a cross-comparison between the different sub-disciplinary areas in art history could be made. Yet, based on our findings, it is possible to make observations such as this which can potentially lead to further research.

It is worthwhile noting that Participant 10 was an independent scholar at the time of the interviews. Thus, accessibility in relation to cost may be one of the primary considerations scholars not associated with an institution at a particular time in their career can have when deciding on the resources to use for their projects. As this scholar argued at another point during the interview, colleagues' support was valuable when facing such challenges (e.g. through sharing information); actually, colleagues' important role in facilitating scholarly practices or overcoming challenges will be frequently encountered while presenting this thesis's findings. Language, though, was another matter that, as seen in this quote, came up in the discussion about the reasons scholars chose particular resources or material; it will be shown later that language can be an issue which can affect certain aspects of the research process, such as information seeking (see 'Information Seeking as a Challenge' section) and scholars' decisions to trust specific resources (in this section).

Considering the visual resources, in particular, although the factors described previously applied in this case as well, accessibility in relation to cost incurred by copyright reasons and quality of material available were often two of the most important criteria scholars took under consideration when looking for related material. A quote from the interview conducted with Participant 01 gives an idea of the criteria considered when searching for visual material.

> The ones I prefer are the Archive of the Lucca Archivio di Stato Pergamene and Gallica because of the richness of the visual material; principally the visual material that is of early illuminative manuscripts. The Getty website, the MET because of the high quality and high resolution images which they put up. But I'd say the ones I used most were Gallica and the Archivio di Stato in Lucca. [Participant 01]

Yet, as in the case of Participant 11, the need to find and use the right image for the purposes of a project may often supersede any challenges related to copyright and costs. On the other hand, the use of images for teaching purposes can be more flexible in terms of copyright; when the quality is not satisfactory, scholars may look for other ways to secure the visual material needed.

> Ok, right. Images that I include in the research; I include what I think I need to. And then, after that, I worry about how I'm going to get hold of them because this could turn into a discussion about copyright that could potentially be endless. […] Regarding stuff that I use to teach with, probably I shouldn't say this, but 90% is scanned by me and the quality is better that it is on some commercially available image databases [name of com-

mercial database removed]. [Participant 11]

Thinking about reliability as a factor for choosing the resources to be consulted and the material to be used and quoted in the context of research or teaching in the field, art historians participating in this study explained their criteria for trusting information. Based on our findings, trusting the author or the institution providing the information were the two paramount criteria for scholars when deciding upon the resources to be consulted and used. Other criteria included trusting the publisher or particular resources frequently used in academia (e.g. JSTOR). The quotes below, taken from the interviews with Participants 02 and 19, provide an idea of their criteria of reliability when looking for resources.

> I think, at the moment, I'm still looking for information provided by a particular institution or particular author, because this is how I assume the reliability of this information. I know that when I look for information in an academic institution or a major museum, I can trust this information. Although, if I just pull something accidentally through Google, I never dismiss the information. I just check whether it is reliable or not. [Participant 02]

> I'm always aware of the Internet being quite an unregulated place. So, you go to things like JSTOR which I know is very academic and very vetted; everything there has been screened because it comes from academic journals. So, I wouldn't have any qualms about using that. Otherwise, if I know that is a well-respected institution, like say the V&A Museum or the Institute of Education, I'll probably trust it. [Participant 19]

Additionally, previous experience and intuition often came up as the researcher's tools when evaluating the trustworthiness of a resource. However, there were some cases that the above criteria were not enough in order to judge the reliability and quality of a resource. For instance, according to Participant 07 below, language can pose its own challenges when scholars attempt to make related judgements.

> I think I had a specific challenge like anyone who is working across languages and working across different areas of scholarship. Spanish scholarship is very different. The approach to scholarship is very different than in the English language and I think I struggled with that at first because it's not my first language and it's hard to tell from the quality of writing; that's often a good gauge in a sense that someone is writing comfortably about something and you can get a sense of it. […] But I didn't have that advantage with Spanish. [Participant 07]

In the case of this participant, it is worthwhile underlining the connection between the interdisciplinary nature of research and the challenges posed by it, such as those described in terms of language, which inevitably increases the degree of complexity when looking for information and, thus, may imply particular information needs. As Palmer and Neumann (2002, p. 107) argued, translation can complicate information seeking and gathering as well as other scholarly practices (e.g. reading) and, therefore, there is greater necessity to understand the information practices and needs of scholars in the Arts and Humanities conducting interdisciplinary research. Furthermore, research projects examining non-traditional topics such as internet art, which may require the consultation of non-traditionally used resources (e.g. mailing and discussion lists) may lead to alternative methods for confirming the reliability of such information; in the case of Participant 17, a method for checking the trustworthiness of the discovered material was to contact the responsible people (e.g. artists).

> In terms of trusting resources, I suppose because I studied Internet Art, a lot of material that surrounds Internet Art, a lot of the online mailing list based discussion was not especially deliberately falsified; there were lots of text based stands where artists were using discussing spaces to create alternative histories. […] So, it's harder for me to assume that something is valid just because it exists, like I can't say 'Oh, it's in a book, therefore the publisher and various other people have agreed to this'. So I probably then got a lot of the time to go and talk to the people who were involved. [Participant 17]

Also, it may be interesting to note that, in terms of trusting resources like Wikipedia, opinions were divided; interviewees, like Participant 03, found it a useful resource to some extent. Yet, the fact that the participants often needed to check whether part of the information was correct, in combination with certain attitudes in academia towards the use of such resources, meant that scholars tended to consult them, but not necessarily reference them. As for the attitudes and beliefs, in particular, it may be worthwhile remembering Participant 04's statement about what might be considered 'probably bad art history' (starting research with images and not with the actual art object); thus, it can be possibly assumed that the use of such resources for academic purposes might well be regarded, according to current academic training in the field, as 'bad art history'.

> I mean, I use Wikipedia. I know my supervisor goes mad when I mention Wikipedia but, firstly I think this is a short of snobbism of generation. I think Wikipedia is terrific. It's wonderful for dates and things. You're writing and you want to know what is the date of Constantine the Second. Of

> course you've got to check if Wikipedia is correct, but the articles by and large now, in my experience, are quite well referenced. [Participant 03]

The following excerpt from the interview with Participant 15 reveals, in their opinion, which are the appropriate resources to be used for academic purposes (in this case, for a journal publication); yet, according to this art historian, consulting and referring to 'myriad resources' when it comes to blogging is considered an acceptable practice.

> If it's for a journal, it is mainly, as I say, using libraries, using my own library, using the University Library, using libraries in the Midlands, like Oxford. I use the Web to look at titles and so on before I go, so library catalogues definitely. The thing is on the blog, they come in various ways. They come about if I'm reading something in a book, if I read something on somebody's blog or that I've read it in the newspaper, or somebody said something to me. I mean there are quite a lot of sources and can result in things being generated on the blog. [Participant 15]

Furthermore, aspects of the design of a resource, such as the way digitisation has been conducted or its interface, and the experience it offered, as a result, to the user was a factor influencing scholars' information behaviour.[64] Therefore, such issues were not only the reasons some scholars preferred to consult an art object in person (as seen in the 'Information Objects' section), but they could also constitute factors influencing their decisions as to which resources to use more generally. Participant 09, based on their experience with online collections containing digitised material, gives an example of potential problems that can be encountered when using a digital resource, while Participant 03 explains why they avoid using particular resources.

> I mean, I have a manuscript in Rome. It's held in another library, not in the Vatican, and they have digitised their collection, but for some reason that I'm still trying to understand they have digitised only the decorated part of the page. So, basically I get a decorated initial and I cannot read the text. [...] There are choices that have been made online that to me are completely absurd. [Participant 09]

> Well I think, as I say, these websites that are sort of databases, I don't find them very helpful. I do try to avoid those, because I do find the effort you need to put in to understand them to get stuff up tends to be quite high. So I tend to try and avoid this sort of very dedicated websites which are special

[64] The design of the digital resource was also found by Urquhart and Rowley (2007) to be one of the factors influencing the information behaviour of students with regards to the use of digital information resources for their learning.

> and you see all sorts of stuff [unclear] because they tend not to have quite what you want and I don't seem to get quite used to finding this stuff, so I do tend to just use the search engines and see what it comes up and go from there. [Participant 03]

Consequently, considering access to resources in the broader sense,[65] there were several issues raised through the presentation of the findings so far both with regards to physical and digital resources (summarised in Figure 2): difficulties in gaining access to physical places; issues related to copyright, cost and language; lack or limited availability of digital resources in particular areas of the discipline; access to problematic digitised material. The next sub-section will present in detail the resources mostly used by this study's participants in the context of research and teaching, along with any reasons that justify scholars' preferences.

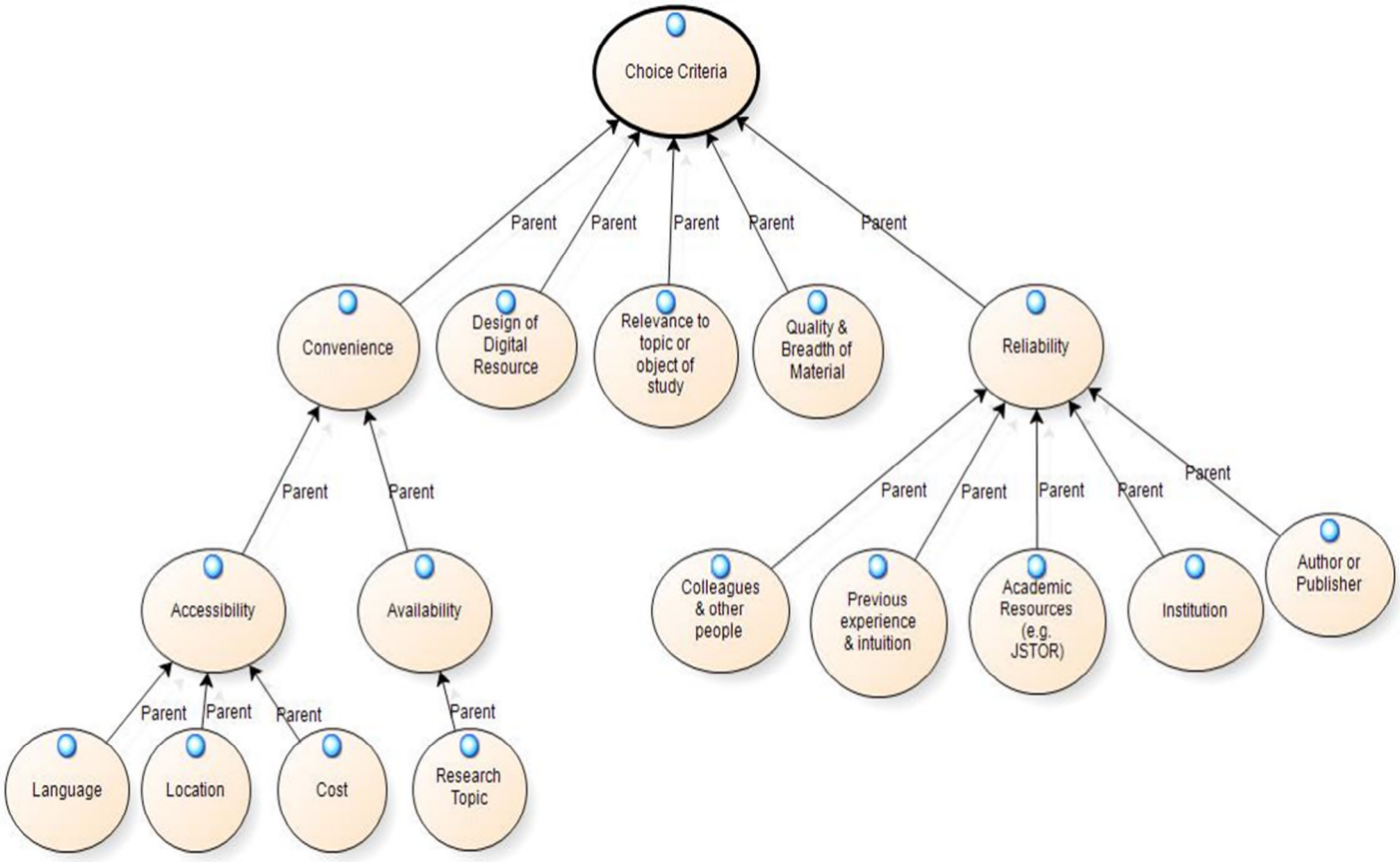

Figure 2. Model (based on the NVivo codes) showing the main factors influencing art historians' behaviour in terms of resources used.

[65] Access to information in this case is considered in its broader sense, referring to matters related to open access resources but also to the issue of easy access to resources which are available either physically or digitally and access to material which can be useful to researchers in the field.

5.2 Places

During the presentation of some of the main criteria upon which art historians decided to choose particular resources, it became clear that some of the places (digital or physical) they visited tended to be more frequently mentioned. Therefore, the British library was one of the places most scholars mentioned visiting at some point when looking for information, mainly for the great amount and variety of resources available (either digitally or physically), such as manuscripts, newspapers and so on. This extract from the interview with Participant 13 is an additional example.

> So, for me, my main archives include an Arts Council collection that is housed at the University of Bristol and has a specific Theatre and Live Arts section. In London, there's also the Live Arts Development Agency which has a lot of the video recordings of the performances and it has also visual data in the form of slides. It has also a lot of books and some online resources, but I haven't had the chance to look too much at them. The British Newspaper Library has also some newspapers; I'm still however looking into what exactly I need from them because they have a tremendous amount of resources. So, I would say that these are the three main ones and there are a lot of other smaller ones. [Participant 13]

Other resources commonly used for research and teaching were the online collections of well-known museums such as the V&A (Victoria and Albert Museum, London) and the MET Museum (Metropolitan Museum of Art, New York). Additional digital collections where scholars found useful information for their projects included- but were not limited to- those of the British Museum, the Wellcome Collection, the National Gallery, the Getty, the Bodleian Library in Oxford, the Internet Archive, the National Archives in London, the National Library in London, the Arts Council, the French *Bibliothèque Nationale*- e.g. its online resource Gallica- and of many other libraries, museums and archives in the UK, across Europe or overseas. Also, COPAC[66] was regularly used for bibliographical research while art historians in this project could use various other resources and websites providing material related to their research or teaching, such as ArtSTOR,[67] VADS (Visual Arts Data Service)[68] or Rhizome.[69]

[66] COPAC, http://copac.jisc.ac.uk/.
[67] ArtSTOR, http://www.artstor.org/. However, although ArtSTOR has been previously presented as a resource that could appeal to art historians (Rose 2002; Marmor 2003), in this project, it was only mentioned by one participant. However, Beaudoin and Brady's findings (2011, p. 30) also showed that none of the art historians participating in their study used this resource.
[68] VADS (Visual Arts Data Service), http://www.vads.ac.uk/.
[69] Rhizome, http://rhizome.org/.

Furthermore, JSTOR[70] was used by most of the art historians participating in this project; yet, it can be argued that this finding was anticipated to some extent, as JSTOR is one of the longest established digital resources that most academic and other institutional libraries- especially in the UK- subscribe to. Also, the fact that JSTOR constitutes part of the academic training of students and scholars (especially those supervising PhD students) increases its trustworthiness and, consequently, its popularity amongst Arts and Humanities scholars.[71] However, when considering digital projects, and according to what Participant 02's said, resources commonly used by scholars conducting research in the context of non-digital art history projects may not cover the particular needs these researchers have.

> In terms of images, I don't really rely on the best known repositories of images. I hardly ever use JSTOR. It will be usually an image which I have to request. It's easier nowadays to get access to high resolution images. But, for example, although museums like the National Gallery in London now offer their entire collection online, I may not find what I need there because of the really marginal subject of my research. It's really outside the mainstream art historical interest. [Participant 02]

As this participant further explained, finding useful resources for their projects can be challenging (when they do not create them); more specifically, the types of information objects they are usually interested in (digital imagery, such as 3D models) are often created in the context of collaborative projects and access to them is limited, while only unsatisfactory alternatives exist on the Web.

> This is something we will not find online which is a problem, because access is really limited to the creators and collaborators. What you will find online will be just an insufficient low resolution surrogate. [Participant 02]

Additionally, as it became apparent in an earlier interview excerpt, when the material needed for the study of the art of specific periods, such as nineteenth century, was available in Google Books,[72] this resource was quite regularly consulted. However, according to Participant 03, resources such as Google Books can be used as a first step to another resource (physical or digital) that may contain information based on their particular needs and which, probably, are considered more appropriate to cite. Also, this excerpt includes traces of this art histo-

[70] JSTOR, http://www.jstor.org/.
[71] JSTOR has been presented as one of the most commonly used digital resources by scholars in the Arts and Humanities in various related studies, such as Brockman et al. (2001) and Warwick et al. (2008a).
[72] Google Books, https://books.google.com/.

rian's information seeking behaviour and, more specifically, of the practice of browsing, which as it will be explained in the next section is commonly employed by scholars in the Arts and Humanities.

> The Google Books things are quite good for just giving you a quick look at what an article's like, when it's worth going to the library to get it all if you like. [Participant 03]

On the other hand, other products by Google,[73] such as the Google Art Project,[74] were rarely mentioned as resources used in the context of a research project in the field. Participant 06 brought the Google Art Project up in the discussion in order to comment on the way artists have been indexed, which is based on their first name; actually, this participant did not regard this as an appropriate method for cataloguing artists' names, implying that this may not be a preferable way for art historians to search for artist related information.

> Can you imagine that they catalogued artists by their first name? This is stupid. I know that all Americans, and English even, if they have never seen a person, they call them by their first name. They don't do that in continental Europe as you know. […] But I think this is the same mind-set that has catalogued artists by their first name. So, if you look for Rubens, you find him in the list under Peter, not under Rubens. [Participant 06]

Another interesting aspect of the findings in terms of the online places visited in the context of research was the fact that social media and social networks proved a place where scholars researching on particular topics could find information that was hard to find anywhere else; thus, Facebook, Twitter and YouTube were mentioned in quite a few cases. For instance, Participant 12 below explains how they found useful details concerning their project on Facebook.

> So, this is the Facebook group with Peranakan people portraits that everyone contributes to and if you have any questions about the photograph you can ask. Because a lot of them contribute on family photographs and I saw these family photographs in the database and I was 'Ok, you are the descendant. Hi!' Actually, Facebook was a really good resource for me, especially this lady who is a Professor and a Peranakan and her ancestors were very prominent members of the society. Sometimes they just reply

[73] Apart from the search engines, Google Search and Google Image Search, the use of which will be discussed in the 'Searching though Google' sub-section.
[74] See https://artsandculture.google.com/partner?hl=en.

> ‘Oh, nice hair, blah, blah, blah’, but a few of the members actually give very good facts about images. [Participant 12]

However, it should be noted that, in the case of this participant, there was not much research conducted in their specific area of study; therefore, finding this online community, which provided information related to the material they were studying, proved valuable. Having discussed previously the various attitudes and beliefs linked to academic practice and the use of resources such as Wikipedia, the use of Facebook as a valuable tool for data collection[75] in the above case raises questions as to whether similar views surround this practice or the fact that this is the only method to find specific information makes it more acceptable in the field.

There are also questions about the use of social media as part of the information seeking activity and whether a source is referenced when consulted, especially in a case such as the one described above. Given the fact that there are no studies looking at the use of social media in the context of research and teaching in the field, this is a topic worth examining further in future research.[76] Also, it may be pertinent to note that similar behaviour has been found previously to occur with regards to the use of visual surrogates of art objects.[77] For example, although many times it is considered best practice to visit the artwork in person rather than using only the visual surrogates available, the latter becomes an acceptable and necessary practice when the original artwork is lost or inaccessible (Bakewell, Beeman and Reese 1988, pp. 14-15).

Continuing, with regards to the digital collections used by scholars in the field of art history, it may be worth noting that only one of the interviewees referred to any of the large, collaborative, European online initiatives which enable the discovery of primary and secondary material. In this one case, Participant 09 referred to Europeana Regia;[78] however, the brief commentary below suggested that the design of the resource might not fit the needs some of the art historians interested in manuscripts might have.

[75] Almost resembling crowdsourcing.

[76] Yet, it should be mentioned that there are cases of art historical studies using social media as a topic of research or as primary data; a relevant example is the project by Frost (2013) where she used Twitter when looking at art historical media from a theoretical and practical perspective.

[77] Related observations can be found at the ‘Information Objects’ section.

[78] Europeana Regia provides access to manuscripts from the Middle Ages and the Renaissance, http://www.europeanaregia.eu/en/manuscripts.

> The ways you can search are very limited and it's very rare actually to find a project that has been created with the end user in mind. [Participant 09]

At this point, though, it is worth restating that one of the projects this participant had at the time of the interviews was concerned with the evaluation of digital resources used in the field of art history, with a focus on illuminated manuscripts. Thus, considering this observation, it may be helpful to provide a related statement that this art historian made in another point during the interview, referring to the 'ideal' research platform, the conception of which constituted part of their project.

> But then in Germany [name of city removed], doing the workshop, we came up with this completely utopian [emphasized] research environment. I know that there are projects out there that claim to do that already, one of them is Text Grid, but I'm always very frustrated with these kinds of projects because the project and the structure and the interface get in your way. And it is something I had analysed in that paper regarding the platform; the project and the interface should not get in your face. They should serve your research and they should be more intuitive. You shouldn't really have to learn how to use it, like a foreign language. Because it's going to be something, it's going to be an add-on and it's going to add one more layer of fragmentation to your research. If we want this thing to work, it has to be a translation of art historians' gestures, and not only gestures literally speaking, but a translation of their thinking process which is hard to grasp. [Participant 09]

These observations may suggest that even when material is already available digitally or freely accessible, it might still not be useful to researchers in the discipline. It was shown in earlier parts of this chapter (e.g. in the 'Criteria for Choosing Resources' section) that a problematic experience with a particular resource may be considered by scholars as an additional obstacle in their way to find useful information for their projects; as a result, it may influence their decision as to which resources to consult and how to consult them (physically or digitally). Then, if physically is regarded as the preferable way to consult a resource- as it has also been proved in many of the cases already mentioned-, art historians will probably decide to take their own photographs in order to enrich their personal collections with material which meets their own criteria.

However, despite the challenges, using digital resources and services can be useful when scholars do not have a concrete idea of the kind of information they are looking for or

where exactly to find it. Participants 19 and 17 shared the reasons why they find particular resources helpful under such circumstances.

> I've used quite a bit of the VADS which is something like the Visual, Applied Arts and Design Service. I'm not sure. It's like an archive where they have a magazine that's important for my research called Design Magazine that's been published from the '50s [1950s]. It might still be going on but I'm not looking at very recent issues. So, instead of having to go to say the British Library and retrieve those issues- and sometimes I don't even know exactly what I'm looking for- I use this resource because they have all of Design Magazine's past issues on digitised form and it's much easier. [Participant 19]

> There are bodies of work that I remember even if I don't remember about exactly how I'm going to find them or where they are. Resources like Rhizome are really useful because for a long time they archived a lot of Internet artworks. So that's a good cause of call which is as similar as it gets to going to an art gallery because I can look at an artwork in that archive but I can also more often than not find discussion that surrounds that artwork. [Participant 17]

Moreover, digital resources were found to be particularly helpful to scholars who consulted them for teaching purposes in art history. For instance, Participant 11 mentioned finding electronic material useful when it came to preparing class material.

> I teach a lot, so I tend to use electronic versions as much as possible. [Participant 11]

Yet, teaching, although there is often flexibility in terms of copyright, has its own challenges in terms of the information objects to be used and the places to be found. For example, Participant 20 explains how the material needed is subjected to requirements posed by the topic taught as well as the level of the tutees.

> It would either be to a library or a museum or if I'm teaching an architectural subject, I'd go and see the building that I was going to be teaching and photograph it on site, because quite a lot of the things that I teach are not available visually on the Web. You can get generic images of monuments that are popularly taught, but you can't get the details that enable one to teach the material that you want to communicate. […] Well, the level that you're teaching a student will dictate the specialisation of the images you're searching for. [Participant 20]

Thinking about the requirements for designing digital resources that enable art historians to discover useful information, these should be based on scholars' practices and needs (e.g. cataloguing material in a meaningful way for scholars as in p. 112). Through examining the criteria upon which researchers in this thesis chose digital resources as well as their preferred practices for seeking and engaging with information, it also became apparent that these should be easy to use in order to meet the needs of a diverse group of scholars (e.g. different degrees of technical ability).

The interface design should be simple (e.g. see pp. 113-114) and the functionalities provided should encourage different types of searching. More specifically, given art historians frequent need to browse content in collections (e.g. when they are not sure what they are looking for as in pp. 114-115) and to engage visually with information (e.g. see pp. 119, 154), digital resources targeted to this group of researchers should enable visual exploration of collections. This could be achieved through allowing users to get an overview of the material (or groups of information) in a collection, providing suggestions for similar content and offering services that facilitate intuitive interaction with information (e.g. zooming in-out, flicking through) (also see Shneiderman 1996, Whitelaw 2015).

Apart from that, including related metadata alongside the digital objects in a collection as well as information on the decision-making process with regards to digitisation will enable scholars to make informed decisions when using digital content and gain necessary details for the purposes of their work (e.g. see pp. 97, 108-109). Finally, enabling access to digital collections through different means, including the ability to view and download material, is necessary in order to meet scholars' evolving need to access and manage material across devices and tools (the variety of devices and tools used by art historians in this thesis can be found at pp. 157-158).

Finally, after the discussion over the resources (physical or digital) that scholars in this study visited for academic purposes and beyond, the challenges and considerations about the discovery and access of the needed information, and the presentation of the user requirements for building useful digital resources, the next section will look at the specific practices employed during the quest for information.

5.3 Information Seeking Practices

Generally speaking, regarding the information seeking practices followed by art historians participating in this study, it can be argued that chaining and browsing were the two most commonly employed. The interview excerpts below, from those with Participants 09 and 16, demonstrate how these activities were conducted during the initial stages of the research process.

> I began with the major exhibition catalogues that had to do with my manuscripts. I noted where they were held and then I scanned the pages, because in exhibition catalogues you only get one or two images of each manuscript. […] For example, I had two books of Hours held in Bodleian in Oxford and they have a pretty good collection online. So, I found all the decorated pages for both manuscripts, whereas in the catalogue I only had one image. And then the collection would grow naturally through reading the secondary literature. I would usually find references to other manuscripts in the footnotes and I would go again back online looking for possible images, which go of course in the secondary corpus. [Participant 09]

> Obviously, on the one hand, there's secondary literature which is usually the first point of call. So, that's obviously primarily books and papers and I use the bibliographies from those to then track down other secondary and primary resources to give me the way on. But other than that, the primary resources; I tend to use a lot of online archives which are available. Our library at the University I study [name of University removed] has signed to quite a lot of online archives; so, those tend to be for me archives of Victorian periodicals and Victorian newspapers which are keyword searchable, but you can also browse issues and so forth. [Participant 16]

However, direct searching[79] was possible when the participants knew exactly what kind of information they wanted and where to find it; the following quotes from the interviews with Participants 20 and 09 imply that when scholars knew what information objects they were looking for in advance, it was likely that they used certain terms to search through specific digital collections and other databases.

> I tend to know what it is that I want to find. I know the detail before I search within a library to discover whether or not they digitised a particular manuscript. [Participant 20]

> So, for every single library that held one of my manuscripts, I did an online

[79] According to Palmer, Teffeau and Pirmann (2009, pp. 10-11), direct searching is conducted when scholars have a predefined goal and, thus, the use of keywords is often specific and familiar.

> search looking for additional images or better quality images. And in some cases that was a fruitful search. [Participant 09]

Many of the interviewees participating in this project tended to start their research online (as also in Antonijević and Stern Cahoy 2014, p. 282) or from their personal collections and the material they had usually at their home office[80] and, then, if considered necessary (based on the factors and criteria discussed in the previous section), would choose to visit specific resources in person. The quotes that follow from the interviews with Participants 04 and 11 demonstrate that searching online for information has become a standard practice in the research process of art historians.

> I mean, I suppose normally I'll find something by searching for it in a library catalogue, and that could be any of the libraries in London or the British Library or more internationally. [Participant 04]

> I always start with COPAC, but I could start with the Library of Congress or something like that. Because I always start over with the COPAC, I'll just go over somewhere which turns out the information. Then, if necessary, I think about how to get hold of the information which is obviously the disadvantage with the bibliographic things. But it's not insurmountable given that the British Library is on the doorstep in some way. [Participant 11]

Thinking about the reasons why scholars may prefer to start their research on a project online, apart from the lack of geographical limitations, it seems that the possibility of a serendipitous discovery[81] that such a choice may entail is considered an important factor. For example, Participant 04, while talking about image search, underlined the fact that using Google Images[82] may lead to unexpected findings.

> Normally, it's museum websites. […] But I suppose Google Images throws up stuff that you might not have known otherwise. [Participant 04]

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[80] A discussion on scholars' personal workspace and habits when working there will follow in the next chapter of the thesis.

[81] Serendipity is generally considered as a chance encounter of information which can lead to an unexpected result or provide a new perspective (Erdelez 2004; Rubin, Burkell, and Quan-Haase 2011). In chapter 10, where we suggest areas for future research (p. 236), a methodological approach to study serendipity in art historical research is presented and explicitly discussed. More specifically, the focus is placed on the factors that affect serendipity in art history, such as the elements of the environments, any strategies employed or the research stages where this is more likely to happen.

[82] Google Images (https://images.google.com/) was first introduced in 2001. More information can be found at the company's website, https://www.google.co.uk/about/.

Another interesting point, though, which implies that serendipity may affect the way scholars look for information is the statement Participant 01 made about 'trial and error' as a way of finding the needed information digitally.

> I think it's generally true that people tend to find what they need digitally by trial and error. People say Google and you occasionally get a sort of a passing reference to 'Oh there is a good website, have you tried Gallica?', but there are very little structured places to go for digital resources. [Participant 01]

Also, Participant 03's account of the way they look for material on the Web may suggest that serendipity can influence the material that is going to be collected in the context of a research project.

> I mean, there are a lot of these very early texts, these are Victorian texts, all do these seem to be often on the Web somewhere, but I don't intend to go looking for them now. If they come up, I'll go for them [unclear]. But I don't tend to go looking for them. [Participant 03]

Concerning the issue of serendipity, more specifically, several studies have looked into its role in scholarly practice and examined whether it can be supported by information systems. For instance, Foster and Ford (2003) studied serendipity in the context of the information seeking behaviour of interdisciplinary scholars and suggested that further examination is needed in order to understand that phenomenon which, as they argued, is '[…] a difficult concept to research since it is by definition not particularly susceptible to systematic control and prediction' (2003, p. 337). Yet, a point of interest in Foster and Ford's paper- for the purposes of this study- was an account by an art historian (2003, p. 335) who described how they experienced serendipity through browsing printed periodicals, put in shelves in a 'user friendly' way (covers facing out), at the Senate House Library in London. In fact, this scholar's experience reveals an important aspect of art historian's information behaviour which is the need to engage visually with information; an experience that, as it will be explained later in the thesis, is particularly linked to conventional material.

In 2011, Quan-Haase and Martin explored the use of EBooks by a group of historians with the goal of identifying whether scholars still experienced serendipity in the way they did with conventional formats (as the art historian previously did). They found that some of them attempted to reproduce the physical experience of serendipity, but most of them were concerned about this aspect of information seeking when using digital services. Thus, based on the above studies, it becomes evident that facilitating serendipity through digital tools and

services or, sometimes, persuading scholars about this possibility, can be a challenging task. However, Makri et al. (2014), in their paper examining the strategies employed by a group of creative professionals[83] in order to influence the chance of serendipity in digital environments, argued that, if we manage to support and enhance such strategies through digital tools and services, the likelihood of a serendipitous discovery can be increased. According to the authors, a significant component of such strategies is the personal 'insight' that users, often, intuitively add to their searches and which can make the difference in finding unexpected information that could offer new perspectives (Makri et al. 2014, p. 2185).

Thinking about the current research and the findings presented before, several of the art historians provided examples illustrating the fact that serendipity can be experienced not only though the use of conventional formats, but through the use of digital services as well. Nevertheless, a detailed analysis of the issue of serendipity that surfaced during the interviews and a discussion on potential ways of enhancing it digitally would be beyond the scope of this research. Given the fact, though, that no previous research has looked into the factor of serendipity and how it affects the information behaviour of art historians- and the research process more generally- or on any strategies that researchers follow in order to achieve such an experience, it would be particularly interesting to investigate further this aspect of scholarly practice. Understanding the practices of art historians with regards to this part of their information behaviour as well as the decisions behind them, can lead to the design of digital tools and services that could potentially facilitate the whole research process. In the next subsection we look at the search engines that participants used to find information.

5.3.1 Searching through Google

Thinking about search engine use as part of the information seeking process, art historians used them extensively in their quest for information. Considering any differences that might exist between the number of searches conducted for finding textual material and those aimed to find visual material, it is challenging to draw any conclusions since this study was not designed to examine the searching behaviour of scholars. Based on the findings of this

[83] Based on the discussion around Shneiderman's framework and its usefulness for this study (see 'The Initial Stages of Art Historical Research' sub-section), art history can also be considered a creative discipline.

research, though, we can argue that both types of searches were heavily conducted by the art historians (especially through the Google search engine).

However, while both textual and image searches could take place when scholars begin to look for information on a topic that requires both types of information (as it often happens), the availability of information found for each type could affect the amount of future searches conducted in the context of the same research project. For instance, as has been already noted, there might be cases where scholars find it very difficult to find images based on the criteria imposed by their project needs; thus, in such occasions, art historians may choose to create their own visual material (e.g. through taking photographs) rather than continue conducting a large amount of image searches. It cannot be claimed, however, that scholars will stop checking occasionally the availability of such material online, especially in the context of projects that last for a long period of time or due to longstanding interests in particular topics.

Google Search,[84] in particular, was the most popular search engine amongst this study's interviewees which, when combined with other practices, constituted a standard step in the process of finding information. As Participant 02 said, 'Googling' things worked even for re-locating material that scholars may have had already in their collections, but could not find at a particular moment in time.

> No, I think Google is definitely now the search engine I use most frequently and I can't imagine life without it really. It's quicker to find something on my computer via googling than by going through my files. [Participant 02]

Google Search constituted an important part of the information seeking process in Participant 17's work as well. It is also worth highlighting this art historian's practice of involving other people as part of their quest for information, through the use of online services (in this case, Google Docs); as it will be shown later (see 'People' section), specific people, like colleagues, were frequently consulted for information seeking purposes either in person or digitally.

> I always go straight to Google and probably I would open up a lot of tabs all at the same time and work from different social media aggregating tools. […] One approach I would do is I would open a document on Google Docs so that I've got something that it's easy to share with other people; so that they can support me with ideas if need be. And then I would

[84] See https://www.google.co.uk/ (the UK version of the Google Search Engine).

> do a Google search for as many resources and leads as I could find and I would probably then spend however long it takes to walk my way through what's immediately available. [Participant 17]

In addition, regarding scholars' need for digital visual surrogates, searching through Google Images was a popular way of finding relevant material (as also found by Beaudoin and Brady 2011, p. 30). For example, Participants 04 and 20 explained how they used the Google Image search function when looking for information in the context of their projects.

> So, what I normally do is I'll do a Google Image search. So, I'll go to the images and actually search for that image over and over again and see if that gives me any more information. [Participant 04]

> So, I know in advance that that is material I can't source digitally and I have to do it in some other way. And in that instance, I will often just Google something and search through the images that are thrown up. I mean generally 80% of the time you can find images if you are hunting for them, but there are certain things which are just not available. [Participant 20]

However, through the analysis of the interview data, it became apparent that using the search facilities provided by Google was not just a method for finding necessary material, but it was also a way to check what is available 'out there'.[85] A quote from the interview with Participant 14 further illustrates this argument.

> In terms of artists' paintings, sometimes I Google just to check whether there is already anything digital online. [Participant 14]

Moreover, it is worth highlighting that, often, Google searching was one of the first steps taken in the overall research process.

> No, I tend to just type into Google and just see what comes up. [Participant 03]

Therefore, although some of the earlier studies in the field (e.g. Rose, 2002) have found that searching through Google was a disappointing experience for art historians, more recent research (e.g. Larkin 2010; Beaudoin and Brady 2011) has noted the increased reliance of scholars upon the results provided by search engines and, especially, Google. Yet, this shift in attitudes has been mentioned by researchers studying the information seeking behaviour of

[85] This practice also resembles what Marchionini (2006) described as *exploratory search*, while he argued that better tools and services are needed to support this practice conducted by scholars.

other humanities scholars as well. For instance, Kemman, Kleppe and Scagliola (2014) found that, even though humanities scholars in the Netherlands did not trust the results completely, Google was the preferred search engine for finding information, mainly, for usability reasons. Moreover, they argued that most of the scholars took for granted that the various types of collections are visible through Google,[86] a finding that should be taken under consideration when a digital collection is created. In the next part some of the challenges that participants faced during information seeking are presented and discussed.

5.3.2 Information Seeking as a Challenge

Moreover, despite the fact that in most cases information seeking practices were taking place during the initial stages of research, being involved in projects over a long period of time (e.g. when conducting PhD research) often required looking for more material at a later stage of the research. More specifically, as in the cases of Participants 05 and 15, a potential evaluation of the project's progress- either by the scholar or by a supervisor of the project- may lead to further information seeking in order to meet the study's goal.

> My advisor said to me when I went back 'This is great, I'm really happy with what you're doing'. He said 'I think you need to think this will be a published book. And, if it's a published book, you need to go in and you need to explain more what's happening here, here and here for those who don't know this stuff'. When he said that, my first thought was "Damn, now I have to go back and the temptation will be to expand everything again." [Participant 05]

> But I would say there probably is a point where it depends whether the project is going well really. […] That's a key point; if your argument isn't working, if your actual sell points aren't working, you wonder whether you have enough evidence to back up your arguments. And then you always have to take into account if there are new findings. [Participant 15]

Based on the above accounts, the information seeking activity that takes place when a scholar's project has progressed will probably be more specific in its nature (e.g. looking for specific information to support an argument) than exploratory, which often is in the first stages of a new project. This observation, then, suggests that scholars may not only have different needs

[86] It is not possible, though, to know exactly what is being indexed by Google (e.g. when it comes to subscription sites) due to the complexity of the algorithm (Kemman, Kleppe and Scagliola 2014).

at this later information seeking phase, but also face challenges that could impact on the progress of their project. For example, Participant 05 acknowledged the risk of gathering more information than needed when going back to information seeking at a later phase in a project, an issue which could complicate the later stages of research, such as writing.

Given that previous literature has only looked at information seeking as part of the first stages of art historical research (as seen during the presentation of the literature), this is an issue that has not been previously raised with regards to the behaviour of scholars in the field, highlighting the need for studies, such as this one, which look beyond these initial phases of research. Moreover, although Kuhlthau's (1991) *Information Search Model (ISP)* (see Appendix III) includes an action described as *seeking relevant or focused Information* at the *collection* stage of the model, it still constitutes part of the information seeking process conducted mostly at the initial stages of research and not at a considerably progressed stage, as described by the above art historians.[87]

Apart from this issue, though, scholars were often conscious of additional matters that could affect their information seeking process and, potentially, other stages of their research such as the gathering of this information. According to Participant 16, the vast amount of information available online as well as particular choices that have been made in the context of digitisation projects (as also seen before e.g. in the 'Information Objects' section) can pose challenges that may have not been experienced prior to the digital age.

> Having access to digital sources, you lose all of that feeling of what the content and scope of this resource is and how it came to be in this archive, which does tell you some things about it and so forth. I really think digitisation doesn't just make things easier. It really throws up challenges in the way you have to think about your gathering of sources. It's very easy to just be on the Internet all the time, because there's no time limit. [Participant 16]

Yet, scholars like Participant 07 developed habits (in this case blogging)[88] during the initial stages of research that enabled them to stay in control of any challenges met and assist them with the information seeking process.

[87] Further comments on this argument will follow in the next chapter of this thesis.

[88] As it was also noted earlier, although there are several studies looking into the use of social media in the scholarly workflow (e.g. see Rowlands et al. 2011) and a few focusing on humanists' behaviour (e.g. Ross et al. 2011; Quan-Haase, Martin and McCay-Peet 2015), there are no studies examining the use of social media, social networks or blogging by art historians in the context of the research process, e.g. during information-seeking.

> One really good thing that I did, and I would recommend to anyone doing a big project, is that I kept a blog, a private blog, which was for me to keep track of what I looked at and what was useful. In preparation, for example, for going to Granada, I would say 'These are the things I want to look at. These are the materials that I need'. [Participant 07]

On the other hand, language requirements imposed by a particular project could postpone the searching and gathering of information for a later stage of research. Participant 08 commented on the language barrier which delayed their visit to the primary and other essential resources for their project, affecting the information seeking stage of their project as a whole.

> I did it in the second year; so, relatively early on, basically the middle of my research. At that point, my language skills were not good enough. For example, when I was looking at the painting in the museum I was not able to understand the text. […] So, that impacted on my ability to view those paintings and that's why it is also important to have the digital image for later. […] That year in Japan I got the support from the AHRC [Arts and Humanities Research Council] and I couldn't go back to it, it would have been very expensive. I wish I could. Now I would be able to use those resources much better because my language skills are better. [Participant 08]

Language issues were previously connected to problems faced in the context of interdisciplinary research. However, based on this interviewee, language can evoke challenges in the context of other types of scholarly projects as well, such as those focusing on non-Western art. As a result, digital infrastructure and services that are created to support problems such as this will potentially meet the needs of more than one group of researchers in the field.

Finally, according to Participant 16 and Participant 17, search engines may also pose their own challenges on scholars' attempts to find and access the information they need.

> The other barrier I think is that I find search engines really arbitrary some times in what they do and do not pick up. I mean, I go to search engines to search for two terms I know and sometimes I test it; I know that these two terms are something that the search engine should pick up, but I put them into the search engine and they don't work. [Participant 16]

> I'm very reliant on Google and whether things will show up or not in a search. And, of course, with a video, there might be the most amazing video out there that totally relates to my subject, but unless somebody has described it as such or added some keywords or contextualised it as such, I won't find it. So, that's a barrier in terms of finding the right information. [Participant 17]

These quotes confirm earlier arguments about the increased reliance that art historians in this study had developed on the results produced by search engines and, particularly, Google. Yet, as Kemman, Kleppe and Scagliola (2014) also found, this reliance did not mean that scholars blindly trusted these results or, as the above accounts demonstrate, that they were not aware of any barriers caused by the way search engines worked. Thus, they often tended to employ additional methods for confirming these results (e.g. other information seeking practices as explained in earlier sections), of which the most common was to consult colleagues and other knowledgeable people in the area. The next sub-section will look at the role of people in the initial stages of research, such as information seeking.

5.3.3 People

Continuing, the findings showed that colleagues constituted an important part of the initial stages of research in general, from the understanding of the topic under study to the finding of the necessary information. The cases of Participants 18 and 17 illustrate the integral part other people can play during such phases, influencing scholars' decisions.

> So, the primary resources are by word of mouth. And by bringing things out [unclear], now people who know what I'm doing will come and say 'Hey, come and see my stuff. I've got a box full of things. Have a look at this…' I'm sure this happens to everybody else, but what's really good in working in a very specific area is that when people are going through their own research and they come across something that they think you would be interested in, they'll send it to you. So, I have all these unofficial research assistants who are doing other things. [Participant 18]

> And on top of that I would say, particularly at the moment, I use Facebook and Twitter a lot. So, at the same time as I'm doing that initial research, I formulate questions that would support that research and pop them out through social media. And the way I might do that, is that I might ask questions that I already know the answers to or I already have an opinion to, but often ask them in a way that makes it seem like I don't have an opinion or I don't have an answer to, so that I can approach the research from somebody else's perspective. [Participant 17]

Regarding the assistance Participant 18 received by colleagues in finding information was an experience many of the art historians in this study shared. On the other hand, Participant 17's use of social media for facilitating research at its early stages generates questions about the

degree to which these technologies constitute part of the various stages of the research lifecycle, from the formulation of research questions to the dissemination of the research output. As stated in the previous sub-section (p. 124), there are no studies looking at the employment of social media, social networks or blogging in art historical research and, thus, it is an issue worth examining in the future. This study, by focusing on the stages following the discovery of information, managed to provide a glimpse of the ways these media can be used at different stages of the research process (e.g. understanding of the research topic, information seeking); hence, future research needs to examine not only the role of social media in information seeking[89] but also the ways scholars use them to support the various research practices conducted 'behind the scenes'.

Actually, even in the cases where a scholar was confident in chasing on their own the resources needed, a network of people was considered essential when difficulties or problems arose. In this study, the answers by Participants 08 and 05 illustrate this argument.

> I was very lucky. I attended some manuscript workshops and the lecturer helped me. She introduced me to the relevant Professors and they introduced me to the museums. So it's very informal and you have to rely on the personal connections and your ability to network with academics. [Participant 08]

> And I would say that the most valuable person that I had this period was a high rank person [job title of person removed] at the Prado Museum. And he [name of person removed] was the loveliest man and he would meet me- we've met maybe five or six times- and he would say to me 'You know [name of participant removed], this is really where you need to go to get that information' and he would say 'I will write a letter'. Now, if the Prado writes a letter for you, it will open up every door, almost every door. [Participant 05]

Indeed, the key role that colleagues played in the information seeking behaviour of scholars - and, as we will find out later, when conducting other information practices as well- is a discovery that confirms many previous studies focusing not only on art historians' behaviour, but on scholarly practices in the Arts and Humanities in general (e.g. Bates, Wilde and Siegfried 1995; Brockman et al. 2001; Palmer, Teffeau and Pirmann 2009). Regarding the discipline of art history, more specifically, Stam (1984, p. 128) first introduced the concept of the invisible

[89] Most studies in the field so far have focused on the information seeking behaviour of art historians (see 'Literature Review' chapter).

college in order to signify the important role colleagues played in the information seeking practices of art historians. Several other studies with similar findings (e.g. Challener 1999; Rose 2002; Grindley 2006; Kamposiori and Benardou 2011; Long and Schonfeld 2014) demonstrate the need for better tools and services in order to enhance communication between scholars and, through that, research as a whole. To conclude, having presented some of the main issues related to the role of networking as a practice employed by the art historians in this study for finding information, the next part of the thesis will be concerned with the practices that lead to the building of the personal research collections in art history.

5.4 Findings Summary

This chapter focused on participants' information behaviour prior to the building of personal research collections. Initially, the criteria for choosing resources to use were explored; thus, it was discovered that convenience; design of digital resource; relevance to topic or object of study; quality and breadth of material; and reliability were the principal reasons for visiting particular resources.

Moreover, the data regarding the places visited by art historians in this thesis to find information were presented and analysed. During this discussion, it was demonstrated that scholars studying in particular areas of art history (e.g. non-Western art) faced greater problems when it came to the discovery of information, such as limited access to useful digital resources. Additionally, social media were found to constitute part of the places that scholars visited to find information, an issue that has not been raised by previous literature; this occurred especially when there was a general lack of resources in their area of study.

Regarding the information seeking practices of scholars in this study, browsing, chaining and networking were some of the main methods for finding information, confirming past work in the area; the important role of colleagues in overcoming the various difficulties was particularly highlighted. Yet, although previous literature has looked at information seeking activity as part of the initial stages of research, it became apparent in this thesis that being involved in projects over a long period of time often required looking for more material at a later stage of research. In this case, the information seeking activity was found to be more specific in its nature than exploratory (as it is in the initial stages), suggesting that scholars may have different needs during the different phases of a research project. Apart from that,

findings showed that participants experienced serendipity not only though the use of conventional formats, but through the use of digital services as well, an issue which has not been studied in detail before and is worth investigating in future research.

Finally, through the analysis of the interview and observation data, it became possible to make suggestions for interface design for digital resources. More specifically, it was argued that a simple interface will enable users with different levels of technical skill to interact more effectively with information. Moreover, as art historians frequently browse material in collections and need to engage visually with information, allowing for visual exploration and engagement with content is necessary. Including digital object metadata and information around the digitisation process will also help scholars make informed decisions when using digital information. Lastly, providing the ability to view and download material through various means will satisfy the needs of many scholars who access and manage information across devices and tools.

CHAPTER 6: TOWARDS BUILDING PERSONAL RESEARCH COLLECTIONS

In this part of the thesis we look at some of the working habits of art historians participating in this study and present in detail the findings related to the practices conducted right after information discovery, such as the gathering of the needed material. Moreover, any connections that scholars' behaviour may have to issues explored in the previous chapters is highlighted and, if noted before, further discussed. Looking at the habits of scholars and their preferences when working will constitute a good introduction to their personal workspace, where they usually keep their personal collections. Also, some of these habits are very much related to the practices of information organisation, use and management that will be examined later.

6.1 Art Historians' Personal Workspace

Firstly, regarding scholars' preferred place to work, their home study was the one most frequently mentioned. Thus, despite some of them having work offices, many preferred to work from home where they had everything they needed (e.g. an Internet connection or material collected for the purposes of their project). However, a home office was almost a necessity for scholars without an institutional affiliation, such as the independent scholars taking part in this study. This tendency to work from home also became clear through the photos art historians sent for the purposes of the interview (Image 1)- depicting important to them parts of their collections, including parts of their workspace- or via the visit to some of the scholars' personal workspace for conducting the interview.

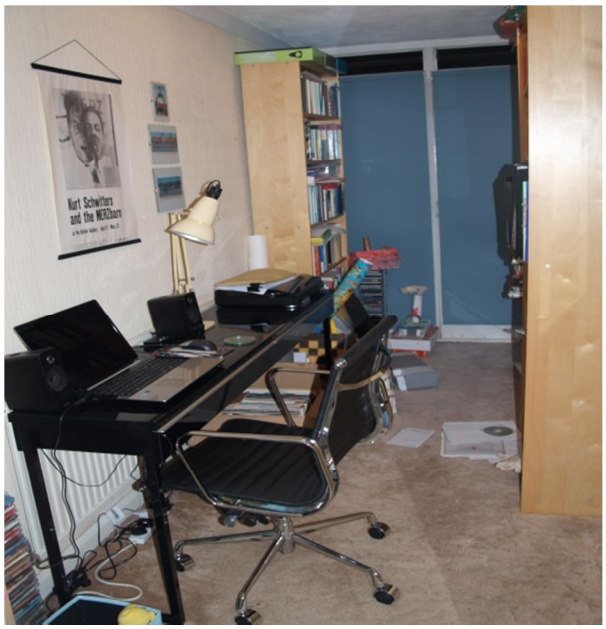


Image 1. Photograph sent by Participant 11 showing their personal workspace.

Considering libraries, archives and other places visited for the purposes of research, in particular, they only constituted a temporary place to work in the cases where scholars needed to visit them for looking at certain material needed in the context of their projects. Participant 03, for example, chose to bring material from the library to their home office, as this gave them the freedom to work in their own time and to have, as they say below, immediate access to their personal collection- principally, a large collection of material in conventional format- where they usually had everything they needed.

> I don't work in the library really, I go to the library to photocopy and to look at stuff and decide what to photocopy. And then I'll bring it all home and I'll work here, because I've got everything here. […] I like it here with all my stuff. And if I want to look anything up I can get it immediately and write up in a time that suits me [unclear]. [Participant 03]

Similarly, Participant 09 preferred to stay at home when working, as it was the only way to make sure that problematic Internet access would not prevent them from using digital resources as often as they wanted.[90]

[90] Actually, this participant's comment about constantly interacting with digital resources confirms what has been previously observed (see 'Information seeking as a Challenge' sub-section) which is that, although much of the information seeking takes places at the beginning of research, scholars may continue checking for information based on their interests at different stages of the research.

> So, this is one of the reasons I prefer staying at home when I'm studying because I'm always in constant interaction with online resources; especially when I know that I'm going to do some work that has to do with manuscripts or possible references etc. I always try to stay at home because I know that I will have to go online and I'll probably find something. It's very disturbing when it arrives in an area where you don't have Internet. This is frustrating. [Participant 09]

As for the PhD students in this study, especially, they often did not have a permanent workspace; their working time was often split between their home study, study spaces offered at the Universities were they were based and libraries visited for the purpose of looking at particular material. Still, places where they could work alone were often preferred over the more crowded ones. Participant 08 mentioned occasionally working from an office at the University where they studied while Participant 14, although working from libraries when it was necessary, spent most of their time working on their PhD research from home where they also kept their personal collection of books and other physical material.

> We only have a sort of shared computer space for PhD students, but I don't like to work in an environment where people talk. I'd like to be in a completely quiet environment when I work. […] When I was teaching last year, I got an office there which I shared only with one other person and I found that this helped a lot to full concentration. [Participant 08]

> I prefer to work on my own. […] Actually, I spend a lot of money buying the books myself, because I think that if I travel twice into London and I already spend fifteen pounds, I might as well spend fifteen pounds on the book with which I'll work from home. So, I've got big piles of books at home. [Participant 14]

Thinking about the findings presented here, it can be argued that they were similar to what Soper (1976, p. 407) found, which was that Arts and Humanities scholars tended to keep their personal collections at their home and work there in comparison to scientists who preferred their work offices.[91] Nevertheless, it should be mentioned that, in this research, keeping a collection at home concerned mostly material in conventional format as the digital part of their collections, stored in various devices, were generally transferrable. Drawing on the earlier discussion about information seeking, these issues can be, consequently, associated with the tendency that these scholars were found to have in that they began research from home, either

[91] Although this is an old reference, being one of the few studies looking on scholars' personal collections raises its importance for the current research.

by looking through their physical and digital collections or by using online information services and search engines.

Yet, it is worthwhile noting that, in contrast to this early study's findings, scholars, nowadays, can work from anywhere; even art historians in this study who collected and used basically digital material preferred to work from the solitude of their home. Even though this may recall the *lone scholar* model (e.g. noted as early as in Stone 1982, pp. 294-295), which is still the prevalent model regarding research projects in the field, the case was different when it came to communication and networking. Actually, with a variety of digital media and services to choose from, such as email, social media and various kinds of networks and forums, scholars were able to communicate with colleagues from all over the world. Thus, even when working physically alone, one could be in constant communication with colleagues online which not only proved useful for finding information, but also for shaping the research argument. Next, we will look at scholars' practices when working with digital and print information.

6.1.1 Scholarly Working Habits: digital vs. print

Generally speaking, while all of the scholars would download digital information when this was available and accessible, many of them would choose to print the material rather than read it on the computer screen. Participants 03 and 11 gave their own reasons for their preference.

> But, I do think by and large, I do find it easier to work on hard copy stuff for actual references. I like the hardcopy. The other thing is with the computer you only see one page at a time, you can't flick through. […] And that actually is a very useful part of it. So, I tend to find papers more useful than the computer. [Participant 03]

> And I have a preference for working with print sources. I mean, I'm also lucky, because obviously, I'm a member of faculty, so I print out as much as I want [laughs]. […] Actually, when I'm reading, I'm physically reading a print even if it is a print out of a digital journal or something like that. [Participant 11]

According to the interview extracts above, it is apparent that the habit of printing out digital information is linked to specific activities conducted as part of academic practice and the issues related to them. For example, based on the accounts by Participants 03 and 11, reading

information in printed format has become a longstanding habit in the context of research; more specifically, the ease of flicking through the pages to browse and find information of interest or the overall experience that a physical book offers and the familiarity that these scholars feel with printed formats have not been substituted by any digital service.[92] However, it is worthwhile noting that Participant 03 also mentioned reading digitally through their iPad.

> I've recently acquired an iPad and I do find the iPad is very useful for reading on the train. Because I've hundreds of things on it. So, if it's an article I know I want to read in the iPad, I'll scan into a pdf and send it myself by email and then download into the iPad and I'll read it on the train. [...] But I do tend to realise often that I will need to print this out. After a while I tend to print it out because with the iPad the problem is you can't annotate your copy, at least I haven't found out yet how to make notes on them- if you can. And what you really need, I think, is two iPads; one with the article on it and one that you keep notes on [unclear]. You can't jump from one to the other. It's actually not very easy to do that or you forget what you are going to quote. So, it's not for making notes- you're going to make handwritten notes which is difficult [unclear] on the train. [Participant 03]

Actually, even though the portability that such a device offers was regarded as an advantage, this art historian found it challenging to carry out other customary practices that they used to conduct during reading, such as notetaking. Similarly, there were other participants who mentioned printing out material in order to read and annotate it; although there are already digital tools and services which have been designed to facilitate this need (e.g. the annotation function provided by a pdf viewer like Adobe Reader)[93], they were not used by these scholars.

It is worth noting that the habit of printing out information to conduct practices like these was one that many scholars shared regardless of whether they conducted traditional or non-traditional research. For instance, Participant 17 (digital art historian) was found to follow similar practices with other scholars on the traditional side of the discipline.

> I still have printed stuff. When I was doing my PhD I invented my own cover sheet for notes that had like a summary section by chapter and so,

[92] In recent years, there have been several studies looking at the reading behaviour of different groups of scholars in the digital age (e.g. Tenopir et al. 2015, Kachaluba, Brady and Critten 2014, Nicholas et al. 2008, Nicholas and Clark 2012). Based on the findings of such studies, reading in the digital environment have significantly increased; yet, printing out material, such as articles, to read, as Participants 03 and 11did, is still considered quite common behaviour, while Kachaluba, Brady and Critten (2014, p. 99) found that scholars in the Humanities seem to feel more comfortable in reading from paper.

[93] See https://www.adobe.com/uk/.

> the whole of the book. That was really quick to fill in and so I do have, not here [name of city removed] but back in the UK, a filing cabinet of loads of articles and all those of articles are printed out, they have my notes attached and the cover sheet attached to them and they're all alphabetized by author. […] But, when I'm with those, I find them really useful because I have always been quite visual, like if I've written something down with a pen I'll remember it much better than I remember something I've typed. [Participant 17]

It is well-known that visual memory plays a significant part in art historians' work (e.g. Brilliant 1988, pp. 121-122); a fact that also became obvious through the discussion with the scholars in this study around their practices, such as the organisation of information (further details will be provided at a later stage). Based on Participant 17's account, making handwritten notes had an effect on their memory which could not have been achieved by typing the information and seeing it on a computer screen.[94] This practice also led to a notes organisational system which, as it was designed according to personal criteria, was appropriate and effective for this scholar's needs.

Furthermore, Participant 06's (categorised as conducting non-traditional research) and 20's (categorised as conducting traditional research) rationale concerning their preference over printed material, added to that of Participant 17, can potentially prove enlightening for better understanding scholars' relationship with printed material.

> Reading on the screen for me, let's say reading digitally if you prefer, is for me just information. […] Some people confuse information with knowledge and what it is on the screen for me is not my knowledge. My knowledge is when I have read and reflected about what I read and then I transfer it in my mind and it sits somewhere. […] At large, you can see it behind me, I absolutely prefer books, not digital information. [Participant 06]

> There'll be more open access than there is because simply at some point a lot of published material will be available online and that would be useful. But I have a feeling that, because I started my training as an art historian using the printed words, I will always feel that the printed word within a book is of importance. Not of greater importance than what I can access

[94] Actually, research studies examining the task of writing as a cognitive process (e.g. in psychology, biology, neuroscience, education) have stressed the different effect that writing by hand has on learning behaviour in contrast to typing in the computer; for example, Mangen and Velay (2010, pp. 385-386, 391) explained how handwriting, by being a slower process which requires high levels of concentration and the visual attention of the writer (e.g. in order to form the graphic shape of the letters), involves different parts of the brain which trigger memory and can lead to deeper learning.

> digitally, but that may also have something to do with being a book person, a manuscript person. There's a connection between the physical object that you're consulting which the computer has never quite achieved for me anyway. [Participant 20]

Thinking about these scholars' comments on why they chose to work with information in printed format, four issues start to become evident: a longstanding association of knowledge with the printed format; the degree and ease of engagement with text that the printed format allows (e.g. for annotations, organisation choices); academic training and its influence on the format preference; and the strong relationship art historians develop with physical objects during their career.[95]

Concerning the trust that scholars develop over printed resources, it is still a prevalent issue not only in art historical scholarship, but in the Arts and Humanities more generally;[96] yet, it can be argued that this attitude towards printed sources is sustained to a great extent through the nature of academic training in the discipline as well as through the engagement with physical objects that this requires, especially when there are not related digital resources available. On the other hand, even when relevant digital resources are available, and as Participant 20 highlighted, it seems that they have not managed to replace the experience that the interaction with a physical object offers; more specifically, this participant argued that even if more material became openly accessible, it would still be difficult for them to change their habits. This particular matter, then, takes us back to what other scholars mentioned about their experience with physical resources as well as to Participant 06's statement about their knowledge being produced through interacting with information in printed format. Participant 06's comment, particularly, about transferring this knowledge to their mind closely recalls what Participant 17 noted about their visual memory which is triggered, especially, when handling printed material.

[95] A discussion around art historians' relationship with art works is presented in the 'Literature Review' chapter, pp. 28, 31-33, while the reader can get a glimpse of the methods used to study artworks in chapter 4, pp. 89-91.
[96] It often affects scholarly practices as well, e.g. scholarly communication practices while it can be argued that it complicates the practices related to information management, especially when scholars have to deal with printed and digital material at the same time, on which we will elaborate further later. For more information on the former issue see, for example, Bulger et al. (2011, pp. 6-7) and Warwick (2012, pp. 13-15) and on the latter, Antonijević and Stern Cahoy (2014, pp. 284-288).

It is important to note, though, that there were interviewees in this study, such as Participant 04 (categorised as conducting traditional research), who preferred to read information online.

> I will never print out articles. I'll read them on the computer. And I know people who do, but I don't. It's not really an ethical thing. I just think it's easier. But, recently, towards the end of my PhD I print out a lot of stuff- so, just actual drafts just to see what it would be to look them on a page. [Participant 04]

However, based on the interview excerpt above, printing out information was considered necessary when it came to presentation reasons in the context of academic training and practice (in this case PhD training and the need for students to submit printed copies of their Theses).

Furthermore, printing out visual information in digital format was a choice that some of the scholars sometimes had to make. This was an issue that Participants 08 and 12 were faced with in their projects (both categorised as conducting non-traditional research); printing out the images gave these art historians the flexibility to interact with the material in ways that they could not achieve through the computer. Having to deal with Japanese hand-scrolls (Image 2), Participant 08 was not aware of any digital tool that would allow them to view the scrolls in their totality or compare them with each other, practices necessary for the construction of their research argument. Thus, they found out that the only way to achieve that was to use Microsoft Word and then, in order to compare them, to print out the scrolls in parts (as in Image 2).

> The problem with those hand-scrolls is that you can't put it in one frame on the screen, so I had to develop a method on how to basically read them as one continuous painting. The only way I could do it was by using Word. It's not good, but that was the only way. […] This is the hand scroll painting [the scroll in the image below], so it goes from there to there, and then like this. It's very hard to compare those scrolls. There are ten scrolls like that and how do you compare them? It's not like a Western painting where you've got one frame. This is more like a story book. [Participant 08]

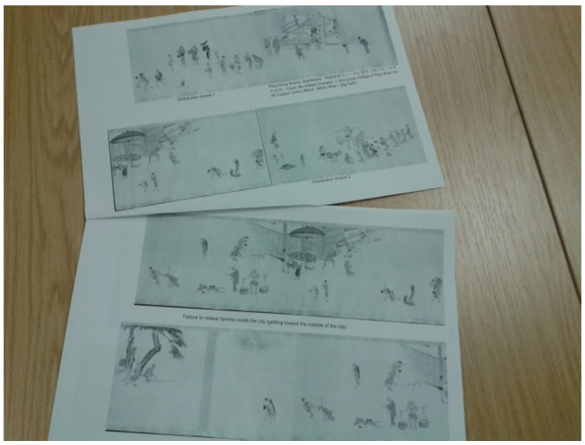


Image 2. Photograph showing print-outs of a Japanese scroll used by Participant 08.

However, concerning Participant 08's research, there was one more reason that led to the printing out of the visual material. As this scholar was interested in exploring the relationship between the images on the scrolls and the text included in the image, they had to transcribe the large amount of textual information embedded in the scroll. As they explain at another point during the interview, this task required constant access to the primary material which was more easily organised and accessed if printed. Therefore, the format of the primary material (long hand-scrolls) and the lack of digital tools and services to support the practices that the treatment of such material required made the choice of print-outs, even though not ideal, necessary.

Participant 12, likewise, was faced with a similar situation; printing out images and putting them on a board above the desk in their personal workspace (Image 3), gave them the opportunity to interact with the material. Grouping, re-arranging and comparing the images, for example, constituted a source of inspiration and facilitated the writing process and the construction of the research argument.

> So, I put up a billboard on top of my desk because I'm writing an essay on the gaze of the matriarch and this is why you see so many pictures. What I did was to print out all these pictures, so I can just stare them all and get inspiration. If the stimulus you're facing is constant, you can't escape it. [Participant 12]

Image 3. Photograph sent by Participant 12, depicting their personal workspace with the board with the printed images above the desk.

Participant 12's account above underlined once more the significance that interaction with information, in as much a visual way as possible, can have in art historians' work. Although this scholar used FileMaker Pro[97] as image management software in the context of their project, it is apparent that handling the material in printed format, allowed for more intuitive interaction and, thus, it was preferred by this art historian for the purpose described formerly.

Thus far, it has become evident that the comparison of information (especially visual) and the constant reference to the material collected (all types and formats) for the purposes of a project are important activities in art historical scholarship. Regarding those participants who worked mainly with material on the computer, and thinking about the activities previously mentioned, they needed to have as much information open as they could manage. Therefore some of them, like Participant 05 (categorised as conducting traditional research) and Participant 09 (categorised as conducting non-traditional research), chose to use two screens when working from the computer.

> So, to give you an example, in this chapter, I'm collecting information about the biography of the artist. And there is one thesis from Rome that I've photographed and there's a book that was published in the 1950s on him that I just got them up on my computer; I've got two screens, one that I'm writing and another one that's to the right of me and which is the same. It is a split screen. And I'm thumbing through the images to look at the pages in copy, because that's the section of that chapter that I'm in right now. So, I'm constantly referring to. [Participant 05]

[97] FileMaker Pro, http://www.filemaker.com/uk/products/filemaker-pro/.

> When I'm studying or reading material I basically consult my collection, sometimes I would do some sort of comparison and, then, when I'm writing or trying to build a hypothesis, this is where I pick different images from different folders and I pin them down in Picasa. […] And then Zotero…Well, I use Zotero every day. You know, having multiple pdfs open and multiple notes floating around. It used to be a lot more practical with two screens because the separation would be Zotero on the one side and Picasa on the other, or Word processor open where I would write and Zotero and Picasa separated on the big screen so that they're always there. [Participant 09]

As with the case of Participant 12, the quotes above illustrate the habit these art historians had to refer to the material collected during the most creative stage of research, the writing phase. Participant 09, especially, made clear the need to work with both their two principal information management tools, Zotero[98] (bibliographic software) and Picasa[99] (image management tool), at the same time. Regarding images, in particular, this scholar mentioned interacting with digital material in order to be able to examine it (e.g. through comparison), echoing what Participant 12 did with visual material in printed format; yet, while Participant 09 was comfortable working with their material digitally, Participant 12 preferred to work with theirs, principally, in a conventional format. Thinking about the fact that many of the scholars preferred to work with paper formats or with two computer screens along with the corresponding issues discussed, it may be worthwhile noting here that Rose, in 2002 (p. 38), argued that the art historians in her study preferred using paper systems since computer screens did not allow them to work in the way conventional formats did; an interesting issue considering that, to a great extent, it is still true after more than ten years since Rose's study took place.

Yet, it is important to note at this point that some of the scholars (including younger ones) expressed their concern about the challenges in keeping up with technological advancements and their lack of confidence in their technical skills. For example, Participants 08 and 12 below, while discussing problems faced when dealing with the use and management of information, sometimes expressed their frustration in terms of their relationship with technology.

> I'm not very good with technology unfortunately. [Participant 08]

[98] Zotero, https://www.zotero.org/.
[99] Picasa, https://picasa.google.co.uk/.

> By the way, I'm actually quite a tech idiot. I'm not very tech savvy to be honest with you. [Participant 12]

On the other hand, there were a few interviewees, such as Participant 09, who were frequently asked for advice because of their technical skills.

> I mean this year I got three emails from colleagues asking me how they index their images. And whenever they see me working in Zotero during conferences etc., they always look at my screen and say 'Oh, my God, what is that?' But, still, I don't think I've managed to convince anyone, because it is hard work and people think that it shouldn't be which is a common misconception. Also, it is very hard to convince someone to switch to a tool like Zotero if they already have an important number of references stored in a different system (Word for example) because importing them is not always possible [added by the participant during review and editing]. [Participant 09]

As a result, in circumstances when lack of technological skills affect the decision making and practices of scholars, related training may enable them to familiarise themselves with tools that could be useful for their projects. Yet, when tools and services are not designed to support specific scholarly practices traditionally followed in the field (e.g. interaction with visual information) or are not easy to use- which, according to Participant 09, is often the case-, chances seem to be low that scholars would change the habits traditionally linked to conventional formats.

To conclude, considering the preference for printed or digital formats, there was no strong relationship that could be identified with the type of research conducted (traditional or non-traditional), the career level (junior or senior scholar), the background of the art historians (two of the participants with a background in the Sciences expressed their preference for printed formats while one highlighted their difficulty in dealing with technology) or age (younger scholars often had large collections of printed material or noted facing challenges with regards to the use of digital tools and services).

Regarding age, in particular, it may be useful to note that there have been studies arguing that, eventually, the employment of ICT tools will increase as a new generation of Arts and Humanities scholars takes over (e.g. Wiberley and Jones 2000; Barret 2005); this assumption was based on the premise that younger scholars tended to adopt digital technologies more readily. However, more recent studies (e.g. Rowlands et al. 2008; de Jong, Ordelman and

Scagliola 2011; Warwick 2012) have highlighted that issues such as lack of technical skills or low employment of digital tools and services can still be encountered amongst PhD students and younger scholars, making it difficult to predict with certainty the future use of digital technologies in the Arts and Humanities disciplines.

The findings of this research, as in the studies mentioned above, demonstrated that issues such as these occurred regardless of age. As previously argued, other factors were more prominent when considering the employment of a particular format (digital or print) or any tools to handle it.[100] Thus, academic training, the format of material studied, availability of resources digitally, core art historical practices (e.g. image comparison), and ease of use were all criteria influencing scholars decisions when using and managing digital and print information and, thus, should be taken into consideration when designing relevant tools and services for art historical scholarship.

6.2 Gathering Information

Generally speaking, the art historians participating in this study tended to gather as much information as they could find and that they would consider it to be of relevance to current and future projects (research or teaching) or related to longstanding interests in a particular topic (as also in Palmer, Teffeau and Pirmann 2009, pp. 16-17). For example, Participants' 07 and 20 described the process of gathering information in the context of their projects.

> When I was researching and writing chapters, that was really regular. So, I would say I'd be adding twenty plus references a month or so. Obviously at the beginning there was a lot and then it's less near the end. Recently I haven't been adding very many to be honest. Because I've taken this past year to publish my chapters as articles, I haven't been in line with the research. But I did recently that article that I wrote on the chimney piece which was new ground in some way, so, in that month or two that I was working on it, I did add quite a bit. At the moment I'm only adding things that come to a new research. [Participant 07]

> There will be intense moments when I'm preparing something new that I add a lot of material in one go, but then it will be intermittent additions. I suppose because I've always got the prospective topics coming up, which I know I need to be thinking about and developing, when I encounter an im-

[100] Additional information on the employment of particular tools will be provided in the next chapter.

> age that I know it's going to be useful for whatever it is, I will scan it and store it. So, it's there. [Participant 20]

In both these quotes, the necessity to gather material that relates to the projects these scholars had at the time or to future projects that were likely to follow becomes evident; Participant 20, particularly, mentioned gathering, apart from the information needed for the project they were working on, any image that could be useful to their forthcoming projects. However, in addition to the above issue, there is another matter revealed in these scholars' accounts that is worth noting. More specifically, it seems that the gathering of information is more intense at the beginning of a research project (independently of its duration or scale) while it becomes patchier at the later stages, but without ever stopping completely.

This observation naturally triggers questions regarding reasons that make scholars decide to gather information at particular stages throughout a project and at different degrees of intensity each time, especially after the initial stages of research. Yet, although the reasons scholars may have as well as their needs when gathering information at the beginning of a project can be easily identified, it is more challenging to understand how their practices change over the course of a project, e.g. in the context of a larger one. Participants' 05 and 19 explanations on the ways they gathered material during their projects illustrate the decision making process behind this practice at different stages of their research.

> I don't know if you had a similar experience, but when I started my doctorate, I felt like I had this grand vision of where I wanted to be. And then I realised that I needed to become more specific on what I was trying to accomplish, because my topic was so big. […] So, in the beginning, I was capturing everything from administration documents to personal notes on important painters. I was capturing so much information that I didn't realise it. It wasn't until I was at trip twenty that I really knew exactly what I needed. And so the first ones were blunt work, were cannon blast, and the next ones were surgical incisions of the impression that I was getting. It is a lot more satisfying to be on that end, but it's a lot harder to find the information I need now. [Participant 05]

> But I would say the first year was the main phase of gathering and being quite indiscriminate. Then, the second year you gather but you're much more discriminate about what you choose to include and what you choose to ignore because then you have to contain it. Contain, you know, is a keyword [laughs]. [...] It's always a struggle to keep up on top of all the information that you gather. And you have to make some decisions; even re-

> garding things that you thought would be useful, you have to make some decisions to just discard. [Participant 19]

Again, according to these art historians, the gathering of information was more intense at the start of the project. Based on the excerpt from the interview with Participant 05, particularly, we learn that the change in the intensity with which they were conducting this practice as well as the amount of information they were gathering changed as their understanding of their topic developed. Indeed, by that point, they were looking for particular information that would enable them to construct their research argument rather than material that would provide them with an overview of the subject which, according to the participant, was broad and complex. Another matter that is worthwhile highlighting is this art historian's comment on encountering difficulty in finding information to gather at this later stage of their project where their information needs were more specific; this issue confirms what has been previously argued regarding the different information needs that scholars can have at different stages of the research process (see 'Information Seeking as a Challenge', pp. 123-124) which, in turn, may affect the information seeking practices and requirements scholars have in terms of resources and digital infrastructure to support their needs.

Thinking about the case of Participant 19, it becomes apparent once more that the amount of information gathered decreases as the research progresses. Considering the fact that this participant was a PhD student at the time of the interview, the first and second year of their PhD studentship was mainly the period where information gathering took place, with the former being more intense. Moreover, through this quote we are informed about another matter that scholars may take into account when gathering information and which can constitute a reason for reducing the amount of information collected; using this information effectively can become a challenging task as a personal collection grows. Thus, when faced with such concerns, this scholar argued that reducing the amount of information gathered by being more discriminate or even deleting information after re-consideration is necessary in order to handle the material more efficiently.

At this point, it may be worth bringing into the discussion Kuhlthau's *Information Search Model (ISP)*[101] (1991, pp. 366-368) and, more specifically, its *collection* stage (see Appendix III for the different stages). As it was argued early in the thesis (see p. 27), this stage resembles the first part of the building of personal collections, the *gathering* phase (as

[101] Presented in detail in the literature review chapter.

in Palmer, Teffeau and Pirmann 2009, pp. 16-17). According to Kuhlthau, the seeking and gathering of information is more focused at the collection stage as the user has developed the necessary confidence on the topic they are researching; as a result, the interaction with the system becomes more effective.

Based on the examination of the gathering behaviour of Participants 05 and 19, it can be argued that the second phase of gathering they describe bears similar characteristics to Kuhlthau's collection stage. Yet, the task of gathering as described in the collection stage of Kuhlthau's model constitutes, mainly, part of the initial stages of research while that described by the scholars above (and, accordingly, the information seeking stage that precedes it) occurs much later in the process (after reading and during writing). It is worth stating that, although Kuhlthau placed (in the model) gathering at the last stages of information seeking within the initial phases of research, she argued that gathering can take place during other stages of the process as well (Kuhlthau 1991, pp. 368-369).[102] The author highlighted that, while some of the users may develop a more focused attitude towards information seeking and gathering at the collection stage, others may need to organise the material first or to begin writing in order to reach this level (Kuhlthau 1991, p. 369). Furthermore, since this type of behaviour may vary depending on the discipline, it was suggested that further research would help clarify any differences and variations with regards to the ISP model.

Thus, apart from this second, later, phase of gathering identified in the current study, it is apparent through the quotes presented previously (Participants 07 and 20) that these art historians first enter the gathering phase much earlier; more specifically, the early stages of gathering mentioned as well as the feelings associated with it- which are naturally linked to those related to information seeking and the challenges scholars face at the initial stages of research- call to mind the *exploration* stage of Kuhlthau's model. Therefore, based on Kuhlthau's comments above, we can argue that these two distinct phases of gathering (with different characteristics as in Table 3), occurring due to the specific information needs art historians in this study had, confirm but at the same time vary the model.

More specifically, according to the reported behaviour of the participants in this study, an additional gathering task at the exploration stage of the model should be added. The pur-

[102] Later in this sub-section (e.g. see pp. 148-149), it will be shown that gathering (and, thus, information seeking) can indeed take place any time during the research process. However, regardless of how many times this activity was conducted by art historians in this study, we were able to identify two phases of gathering which were of different nature and with distinct characteristics (see Table 3).

pose of gathering at this stage will be the same as that of the information seeking which is conducted at that point: to investigate the topic and find relevant resources. Thus, this task, which takes place early in the research process, can be named *Exploratory Gathering*, follows the *Exploratory Information Seeking* and, during this phase, a large amount of information is gathered in an intense manner. Moreover, the nature of this task is non-selective and it is triggered by the problems scholars in the field face during information seeking, such as access problems, which are often accompanied by feelings of frustration and uncertainty; these issues usually constitute one of the reasons why art historians build their personal research collections (e.g. see p. 36). Also, this stage of gathering requires conducting the necessary practices for storing, recording, labelling, and filing the collected information. As it will be shown in the next chapter, the activities that take place during this early phase of information management can influence the later use of this information as well as any decisions with regards to its further organisation and management.

On the other hand, the second phase of gathering (and, accordingly, information seeking), although it was found to occur at a more progressed stage of the research process than the corresponding task in Kuhlthau's model, had similar characteristics. The purpose of the task conducted at that progressed stage was to find and gather focused information which could help scholars build or enhance the arguments developed from their research. As Kuhlthau (1991, p. 369) also argued, entering the writing stage and having conducted an initial organisation of information may have contributed to this more focused approach to information seeking and gathering. Actually, art historians at this stage needed less information, but more specific in its nature; hence, the intensity of the task was low and was accompanied by a sense of direction. Yet, as explained earlier (see p. 123), being selective during information seeking in order to find focused information proved to be more challenging. Based on these characteristics, the second phase of this task can, then, be called *Focused Gathering* and comes after the *Focused Information Seeking*. Finally, as Participant 19's account demonstrated before, this second phase of gathering can impact the decision making process with regards to the organisation of personal collections as further organisation or re-structuring will be needed in order to use the collected information effectively.[103]

[103] Further information on the organisational practices of scholars and how they affect the use of the collected information will be provided in chapter 8.

Table 3. The gathering phases and their characteristics

Characteristics	Exploratory Gathering (1st phase)	Focused Gathering (2nd phase)
Action	Seeking and Gathering relevant information	Seeking and Gathering focused information
Task	Investigate/ Explore the topic	Build/ Enhance the research argument (often during writing)
Stage of research	Early	Progressed
Type	Non-selective	Selective/ Discriminate
Intensity	High	Low
Information amount	Large	Small
Feelings	Uncertainty/ Frustration	Sense of direction
Effect on personal collections	Creation and Initial organisation of information	Further information organisation/ Re-structuring

First published by Springer (see Kamposiori, Warwick and Mahony 2018, p. 95)

Continuing, based on the assumption that there are two- at least- distinct stages of information seeking (of different nature and with different purpose) preceding the different gathering phases, we can then talk about repetitive tasks or a need to go back to a previous stage and, hence, refer to Shneiderman's framework (2000, pp. 119-124).[104] Shneiderman suggested that non-linearity or repetitive tasks can be part of the information seeking behaviour in creative areas while users can have different needs during these tasks. Having argued that art historical practice could be characterised as creative, especially in terms of its interaction with information, the observations presented above along with the relevant parts of Kuhlthau's and Shneiderman's models confirm the fact that art historians have different information needs during the different phases of their information seeking and gathering activities.

It is also worth noting that this finding constitutes an addition to our current knowledge about the information seeking and gathering behaviour of art historians and should be taken into consideration when designing digital resources and tools to support scholarship in the field. Given that, to some extent, this behaviour was often caused due to insecurity about being able to (re-)access the needed information, identifying the types of materials to which scholars lack access and providing suitable digital resources may help reduce this need for intense

[104] It is also worth remembering that the first activity of this framework is the 'collect' activity; however, it comprised tasks conducted mostly in the context of information seeking behaviour rather than to the collecting activity as it is understood in this study. Thus, here, it is used as a framework to better understand aspects of information seeking that affect the gathering activity.

gathering at the beginning of research. Moreover, further understanding the needs that scholars have during the later stages of research (e.g. more focused material) can lead to the building of digital resources with enhanced searching facilities and useful metadata that will enable the discovery of information as well as to the digitisation of relevant material in the cases where this does not exist digitally.

Moreover, as the case of Participant 19 showed, gathering information indiscriminately early in the research process (from the exploratory stage) can pose information management challenges for scholars later in their research and have an impact on other scholarly activities (e.g. reading, writing). Then, scholars have to take action with regards to the management of the collected material, and sometimes even discard information, in order to be able to use it effectively. Although such practices may be often considered part of the development of a better understanding regarding a project's subject, information management tools based on the needs of scholars could have a positive effect on issues such as those described by Participant 19.[105] This observation, then, brings to mind Meho and Tibbo's (2003, p. 584) argument about *information managing*; even though it is not considered an actual information seeking task, information managing is an essential activity in the cases where personal collections play an important role in the research process, as it can affect positively other scholarly practices and tasks conducted in the context of research, such as information retrieval (in personal collections).

Given the fact that the gathering of information, based on our findings, practically, never ends and the constant increase in the availability and accessibility of information online, managing large amounts of digital data effectively would soon be considered an essential part of the scholarly process; this is another issue which demonstrates the importance of the current study which seeks to understand the ways art historians gather, use and manage information in the context of their projects, a matter not thoroughly explored previously. The ease and speed with which information can many times be accessed online and gathered by scholars is one of the factors that makes their personal collections (especially the digital ones) to continuously develop, posing various challenges for researchers (such as those described previously and others to follow). Thinking about Participant 18's description of the process of gathering the material they generally find, it can be argued that collecting as much as possible

[105] More information on the organisation and management of information as well as on the tools scholars used for these purposes will be provided later.

(as art historians in this study did) is a strategy that is encouraged to a great extent by the issues formerly noted.

> From 'Oh, that's an interesting article! [the interviewee makes a sound to showcase the speed with which things are done now]' to Bibliothèque Nationale, online pdf, download, it is literally two minutes. [Participant 18]

The large availability of information in their area, led also Participant 15 to gather a lot of material that was related to their teaching projects.

> Well, if you count, the images are quite a lot. So, basically, I'm downloading images off the Web which is the main source for visual images. Everything is so freely available. But next to images, I would say pdfs, downloading journals articles. I'm downloading a lot of journal articles for this course I'm doing because the MET has lots. The MET has fifty years of the Bulletin of Art, Metropolitan Museum Bulletin of Art. The directors made that all available free and there're a lot of catalogues free. [Participant 15]

Continuing, regarding especially the periods of research where information gathering was intense, findings showed that this practice could be conducted even on a daily basis; this also implies that the seeking for this information was carried out very often during these stages. In the answers of scholars on the frequency with which they added material to their collections below, gathering various kinds of information is presented as an ongoing process.

> Every day. Literally every day. There's not a day that goes past that I don't put something in my folders, whether it is a picture or a pdf file or a newspaper article or a book. [...] And there hasn't been a day, probably for more than ten years, that I haven't done that. [Participant 18]

> Daily. That's even if I haven't done any writing on a particular entry. There's always something I do every day that relates to my project, whether I located some articles, located a resource, had a discussion with someone, there's always something happening every day related to my project. [Participant 10]

> All the time. I mean, specifically when I'm researching I guess. But, yes, all the time. I'm probably scanning material maybe once every two weeks or something like that. If it's really important I'll scan it when I see it, but yes, certainly in terms of adding journals and things like that it's an ongoing process. I don't have set times where I'm doing it. [Participant 11]

This emphasis on the times of active research we see in the last quote from the interview with Participant 11 is even stronger in the extracts from the interviews with Participants 04 and 13 below.

> All the time. I mean whenever I'm doing research. So, whenever I am in a library I'll be taking notes. Whenever I'm in search for images, I'll be saving them into the computer. It's very rare that I'm doing any research and there isn't some sort of addition, textual or visual, to the repository. [Participant 04]

> If it's, for example, during term time and I'm doing something like finding literature, it'll be very often. I'll be saving lots of files every day; mostly pdf files in the form of articles or books and they'll be at least two, three, four, five downloaded every day and saved. If I'm going into archives and actually taking photographs of material there, it'll come all in one go when I get home and I'll download what's on my camera in the form of photographs. And then you'll have a huge quantity of photographs of what actually might be a small amount of material going in. So, it varies very much as well. [Participant 13]

Downloading information from the Web can take place almost any time and in, potentially, any pattern; gathering material not available and accessible online by physically visiting the place where it can be found can result, according to Participant 13, in large amounts of information collected 'in one go', especially when it is difficult to repeat the visit. Yet, only a small amount of this material may end up being useful to the scholar but, if added to the collection in its entirety, it could pose information management challenges that could impact its overall use.

Similarly, Participant 09 noted adding, particularly, lots of visual material (in Picasa) after their travels while information gathered from online sources was added daily (e.g. references and textual information in Zotero), a practice that Participant 17 was also following (in terms of Web links). Again, it seems that adding material that is considered interesting and could be of use in current projects or at some other point (or not) is a practice generally conducted by these art historians but which, evidently, makes information management essential. This almost daily habit of adding information to someone's personal collection generates questions regarding its storage, organisation, use and management. Participants 05 and 16 provide further details on the problems that can be derived from this practice in combination with problematic information; the issues raised relate to a great extent to Participant 19's account provided earlier.

> So, I'm doing both. I'm gathering related information as I go, but a lot of this is information that I've had for a while but I just haven't read and synthesized. [Participant 05]

> When I'm researching every day, yes, I'll be downloading two things at least, just putting them in these folders, which means that actually in the end, I'll probably only ever revisit a fraction of what I put in there, 50% at most. So, quite a lot, yes. [Participant16]

Therefore, losing track of the information collected and not using it effectively means that information that could be of significance to the progress of research and the construction of the scholarly argument can be overlooked, preventing scholars' work from reaching its full potential.

However, apart from being a tendency encouraged by the availability of digital material in some areas of research, gathering as much as possible is for some scholars a strategy that they have to follow. According to Participant 17, who conducted non-traditional research by employing digital practices, gathering as much material as they can when looking for information was essential due to the nature of the research data they were using. Researching on internet art and using mailing list discussions as part of the research data for analysis, this art historian was often confronted with problems when re-visiting the discovered material online due to the temporary character of its format.

> Sometimes it's just gathering as much as you can at the time and then hoping that you'll be able to Google it later on. [Participant 17]

The case of Participant 17 may suggest that the gathering behaviour of scholars may be influenced by factors such as the type and format of material they collect, especially when this does not fall into the more common types of textual (e.g. pdfs) or visual data (e.g. digital visual surrogates). Based on this finding, further research is needed in order to clarify whether non-traditional formats of information (e.g. digital artworks, visualisation data) involve particular gathering methods, what impact this may have on researchers' work and what requirements it raises in terms of tools and services for facilitating scholarly practice.[106]

[106] Given that, in this study, only two scholars were dealing with these types of data (Participant 02 and Participant 17) as part of their main objects of study (Participant 02, though, was generating their project's data and rarely gathering it), it is not possible to draw general conclusions. However, considering that there is very little information on the behaviour and needs of art historians dealing with these kinds of material, it is worth examining this further in the future.

All in all, as this sub-section focused on the gathering patterns that led to the creation of scholars' personal collections, it was revealed that scholars who gathered information at various stages of a project or those in particular disciplinary, non-traditional, areas (e.g. digital art) could have different needs when conducting this practice. Moreover, the strong connection between this early stage of the building of personal collections (as in Palmer, Teffeau and Pirmann 2009, pp. 16-17) and the later use of the information gathered (such as reading, writing, or managing it) was noted, adding to our limited knowledge about this practice which follows the seeking and discovery of information. Following, some of the personal habits of art historians in this study will be presented and discussed.

6.2.1 Personal Gathering Habits

In addition to the general tendencies and issues presented so far, personal criteria often constituted an important aspect of the gathering behaviour of scholars either when downloading material through the Web or when gathering it through a different process (e.g. taking photographs with a digital camera or scanning material in conventional format). For instance, some scholars mentioned taking care of particular details during the course of collecting the information they were interested in. For example, Participant 02 mentioned gathering the metadata of the digital visual surrogates they were downloading while Participant 09 explained that they always make sure to get a copy of the reference they add to their personal collection, either by doing it digitally (downloading the pdf) or manually (scanning the conventional material, making it searchable through OCR and adding it to the collected reference in Zotero).

> Yes, I will always pull the image with its metadata. For copyright reasons it will be for my personal use. The use of images in teaching is problematic because I prepare hand-outs for the students. I want them to be able to see anything I show in the classroom again and again, which means that either I have to request permission or abuse copyright. [Participant 02]

> I always pay attention to downloading the pdf; if the article is in JSTOR or in a similar kind of database is really easy. If we are talking about book chapters or any kind of textual resource that is not available online, I always scan the pages, even if it takes me two or three hours, and I compile the pdf, I OCR it and I attach it to the reference [in Zotero]. You feel like you're wasting your time, but it's always happening and I'm always very

> thankful for wasting that time because I will go back to the reference that I stored two years ago and it's really handy. [Participant 09]

Based on these accounts, it is apparent that paying attention to details such as those described has largely to do with the effective use of information in the context of their research or teaching projects. In the case of Participant 02, though, we learn that even if collecting digital images with the related metadata is useful for their personal research, copyright issues often restrict the further use of such information even as part of teaching; as we have highlighted before, copyright is an issue of major concern in the field of art history and it has also been one of the principal reasons why scholars build personal collections (e.g. see Grindley 2006, p. 6).

On the other hand, Participant 09's gathering practice was accomplished while bearing in mind the further use and management of the collected information via the digital tools and services they used at the time and the capabilities they offered; according to Participant 09 such a process could be time consuming but it proved beneficial in the long term. Likewise, when Participant 05 described the process they followed for collecting material during their trips, even though they did not aim to use any particular software or tool at the time, they had as their ultimate objective the efficient use of information.

> There are basically three kinds of things that I photographed. One was actual works of art themselves or studies of works of art. I would go to museums and I would always photograph the outside of the museum, I would photograph the painting itself, I would photograph details of the painting that I thought were important and I would always photograph the label before moving to the next photograph. […] That was the best thing I ever did; it was having the labels of those museums. I don't know if I have photographic memory, but when it comes to paintings I do for the most part. I think that all I have to do is go through my library on a thumbnail search and I can find that painting within a couple of minutes. I know exactly what I'm looking for. And the label is right next to it. [Participant 05]

At this point, it is worth highlighting the connection that this participant draws between this specific information practice and their visual memory, reminding us what other scholars mentioned earlier about the handling, specifically, of printed material and the visual quality of their memory (e.g. see pp. 134-135). Again, the need to work with information in a visual way becomes evident; in this case, gathering the required information in a way that facilitates this need, according to this scholar, guarantees its smooth use and management.

To conclude, looking at some of the core habits of scholars at the gathering phase of their research provided an insight into their personal criteria and preferences; for instance, working visually with information was again an issue that scholars took into account when gathering material. Moreover, the previous argument on the link existing between these first phases of the building of personal collections and their later use was once more confirmed through these scholars' accounts. Finally, as generally expected, some of the practices that follow the gathering of information, such as its recording, storing and filing, were brought to light; this aspect of research will be examined in more detail in the next chapter of the thesis.

6.3 Findings Summary

This chapter looked at the working habits of scholars in the physical and digital environment as the starting point for examining and understanding the process of the building of personal collections. Most of the art historians in this study kept both physical and digital collections and tended to work from their home studies. Moreover, it was shown that the preference that many scholars had for working with printed material was due to the opportunities it offered for developing personalised ways of working and facilitating visual memory, a strong characteristic of scholarly work in the field. Other reasons influencing scholars' decisions when choosing to work with print or digital formats were academic training; the format of material studied; availability of resources digitally; core art historical practices (e.g. image comparison); and ease of use.

Considering the gathering behaviour of art historians, it became evident that this aspect of scholarly practice was conducted in two distinct phases, with different characteristics, during which art historians had different needs. By using Kuhlthau's Information Search Model (ISP) (1991), and especially its collection stage, as a tool for examining the related research data, a variation of the model reflecting art historical practice was suggested. This included an additional gathering task at the exploration stage called Exploratory Gathering, during which a large amount of information was gathered in an intense manner. On the other hand, the task of gathering conducted at the second phase was named Focused Gathering since art historians needed less information at this stage, but more specific in its nature. As part of this discussion, it was argued that we need to develop a better understanding of the reasons that trigger this behaviour (e.g. problematic access or the need for 'specific' infor-

mation, along with the types of the required material). This knowledge can lead to more targeted digitisation of material according to the needs of scholars and the creation of digital infrastructure which will facilitate the discovery of useful content regardless of the requirements of each stage of research.

Finally, despite these two phases with distinct characteristics, it should be mentioned that, practically, scholars never stopped gathering information, an issue which could complicate information management practices and re-use of material. In the following chapters, we will have the opportunity to observe more clearly how some of the matters raised so can far affect the organisation, use and management of the gathered material.

CHAPTER 7: RECORDING, STORING AND FILING INFORMATION

In this part of the thesis, the research data around the practices followed by research participants in order to store, record, file and label information in the digital and physical environment will be presented and discussed in detail. Examining the habits of art historians in this study when interacting with information after its discovery and gathering is important for drawing links between some of the main issues that have been presented so far and those that follow on the management and use of information. Additionally, in this chapter, we will have the chance to look at the tools and services employed by the interviewees in order to conduct relevant tasks, learn about the reasons for choosing them as well as the involved challenges; this information will prove valuable for understanding their specific needs and requirements.

7.1 Digital Storage and Recording Practices and Media

Generally speaking, findings showed that, when possible, there was a tendency to store and record information digitally. This applied especially in the cases where scholars were downloading and storing documents (pdfs or Word documents), visual and other material in their computer; taking notes and producing other material digitally (e.g. documents, presentations, 3D models, images of various textual and visual material, blog and website entries); scanning and storing in the computer material that was originally in conventional format; bookmarking and saving Web links or storing bibliographic references.

Below are some examples taken from the interviews with art historians who were, principally, using the computer to store information related to their work.

> I always work on my computer basically. I hardly ever take notes, unless I'm somewhere you are not allowed to use the computer. [Participant 04]

> I no longer take notes, I think. It's either a photo, a shot of a nice excerpt. If I see a book I want to read, it will be a photo of the cover. […] If it's a brilliant [emphasized] shot I don't want to lose, it will immediately go into whatever output I envisage for the project. Usually an article or website content. [Participant 02]

> I do have real paper, but I think I'm moving towards the 'paperless office' except from the hand-outs I print out. I would say that by and large most of

> the documentation is in electronic format. So, it's not that much real, printed information. If I print out a hand-out to the students, yes, but most of it is kept on the computer. [Participant 15]

Thus, in the cases described above, the interviewees refer to their shift from storing material in conventional format to storing information (notes, screenshots, links or documents) in the computer; however, as demonstrated before, in the 'Scholarly Working Habits: digital vs. print' section, some of them tended to print out material in order to work with it (e.g. annotate). Participant 15, though, brings up again the notion of authenticity that printed information often carries for many scholars and which is one of the reasons that many of them still prefer to work with conventional formats. A connection between particular scholarly practices and the medium used to conduct them is also implied in Participant 04's comment on notetaking (more information on this practice follows later in this sub-section); by the phrase 'I hardly ever take notes', this art historian meant that they did not write many longhand notes. Although they did take notes on the computer frequently (mentioned later in that part of the conversation), notetaking in written format is distinguished as a practice, bearing its own characteristics, from taking notes through using digital media.

Considering the ways that scholars record and store information in the context of their projects, scanning material in conventional format or taking photographs of it and transferring it to the computer were very popular amongst the participants of this study. Additional places for storing information in digital format included USB sticks, CD-ROMS, external hard drives, digital voice and video recorders, cloud services (e.g. Dropbox,[107] Backblaze,[108] Google Drive[109]) and other Web and smartphone applications (e.g. Google Docs,[110] 750 Words,[111] Instapaper,[112] Feedly,[113] DoggCatcher[114]) as well as portable devices, such as e-readers (e.g. Kindle[115]), tablets and smartphones. Moreover, when storing material in the computer, Microsoft Office[116] applications (e.g. Word, PowerPoint) were frequently used as well as various types of software intended originally for managing information, such as bibli-

[107] Dropbox, https://www.dropbox.com/.
[108] Backblaze, https://www.backblaze.com/.
[109] Google Drive, https://www.google.com/drive/.
[110] Google Docs, https://www.google.co.uk/docs/about/.
[111] 750 Words, http://750words.com/.
[112] Instapaper, https://www.instapaper.com/.
[113] Feedly, https://feedly.com/.
[114] DoggCatcher, http://www.doggcatcher.com/.
[115] Kindle, https://www.amazon.co.uk/p/feature/4ztw3vfkm5oz3qn.
[116] Microsoft Office, https://products.office.com/en-gb/home.

ographic software (e.g. Zotero, EndNote,[117] Bookends[118]) and image and video management software (e.g. ArtWorks,[119] iPhoto,[120] iMovie,[121] FileMaker Pro, Aperture,[122] FastStone[123]). Likewise, software principally used for creating or editing material, like notetaking software (e.g. Evernote[124]), presentation software (e.g. Prezi[125]) and design software (e.g. InDesign[126]), was used to save and store information. Finally, when scholars' projects (especially digital ones) involved the construction of databases or websites as part of the project outcome, part of the gathered information would be stored in these databases or on the websites' storage space; however, this would also be the case when scholars kept blogs as part of the research process, for example, in order to keep track of the resources found or to reflect on the progress of their work (as in the case of Participant 07).[127]

Following, we will look into the practices of scholars who adopted some of the methods and means for recording and storing information mentioned so far. More specifically, Participants 08, 14, 04, 12 and 10 referred to the various means they used in order to record and store information in the context of their projects; from devices such as USB sticks, CD-ROMs, video and digital voice recorders and external hard drives to computer applications like Microsoft Word, cloud and website services or bibliographic software, such as Zotero.

> I've got my digital camera, then I've got the recording device and sometimes I transfer it to a CD-ROM. I have a store of my CDs with the data, but, because I have to transcribe it, I tend to copy and paste and put it in a Word file as I have to write. And if I just stored the pictures, it is not enough. So, that is not very well done I think. That part of my research is very cumbersome. [Participant 08]

> I've got really big memory sticks because they are quite cheap now. Although what I should be doing is buy cloud space or Dropbox space or buy a big external hard drive. I bought an external hard drive for sixty pounds, like five years ago, then it fell down on the floor after one week and, inside, some of the plugging frame fell out and it couldn't be repaired. And I

[117] EndNote, http://endnote.com/.
[118] Bookends, http://www.macupdate.com/app/mac/7429/bookends.
[119] ArtWorks, https://www.kooltoolz.com/artworks-kool.htm.
[120] iPhoto, http://www.apple.com/uk/mac/iphoto/.
[121] iMovie, http://www.apple.com/uk/mac/imovie/.
[122] Aperture, https://support.apple.com/en-gb/aperture.
[123] FastStone, http://www.faststone.org/.
[124] Evernote, https://evernote.com/.
[125] Prezi, https://prezi.com/.
[126] InDesign, http://www.adobe.com/uk/products/indesign.html.
[127] The relevant quote was presented at the 'Information Seeking as a Challenge' section, pp. 124-125.

> thought ‘No, I’m not going to spend another sixty quid on a hard drive’; if it falls down, you can’t even use it anymore- although I should be doing it for my own piece of mind. [Participant 14]
>
> I use Dropbox; I have lots of stuff in Dropbox. Then I email myself a lot of stuff because I am quite paranoid about losing things. [Participant 04]
>
> I did firstly interviews with my family to find out about my family background [the participant shows me images online]. I used a programme for recording in video format. It’s just portable and easy for family, and I’ve done interviews with other collectors using a more modest form of recording [showing the voice recorder] because some of them are quite old and they are like ‘I don’t want you to record my voice’ [unclear] and if it’s not the voice [unclear], ‘My eyes look funny on recorders’. [Participant 12]
>
> The primary interface for the website is actually built on the Blogger platform, but it’s a heavily modified version of a blog site. Actually, it doesn’t look like a blog. It just looks like a portal page because a portal page allows you to edit the html of the site. […] So that’s how we designed that site and that’s where it’s primarily stored. The references related to the project are stored in a local copy on my hard drive which has redundancy that is like a backup copy, copied on to another hard drive and it’s also a backup that’s done online as well. [Participant 10]

After presenting some example interview extracts in relation to the most common ways of storing and recording information by the art historians in this study, it becomes evident that there are several issues that concern scholars when deciding on the means or the methods they will follow for carrying out these activities. Having enough space, issues of cost and preventing the loss of information were some of the main considerations for the interviewees (e.g. Participants 04 and 14). Furthermore, portability was another factor, for example, in the cases where a device was used as a research tool as well (e.g. when conducting interviews in the case of Participant 12). Technical difficulties or special skills (mainly technical) could also constitute concerns that affect related practices; for instance, when using a database or website as means of storing material (e.g. Participant 10).

Yet, as in the case of Participant 08, there may be cases where scholars cannot find the most appropriate way to record and store information for their type of data. Transcribing the inscriptions depicted on the Japanese hand-scrolls studied as part of their project was an essential practice for this art historian who focused on the relationship between image and text; faced with the need to record and store the different pieces of information together, this participant used Microsoft Word, but without being totally satisfied. This difficulty in finding the

right method for recording and storing information is also illustrated by the quote below from the interview with Participant 17 who was researching on Internet art.

> That's quite ad hoc and I'm having that problem at the moment. I've migrated across several different platforms in terms of how I stored various things and then there's always a new way of working, there's always a slightly different way to keep art which is difficult. Quite simply, some other things, I end up copying and pasting them into Word documents and adding as many links as I possibly can, that means I should be able to find that content again if it's migrated to different platform or the link breaks later on. [Participant 17]

Also, Participant 06 referred to the difficulties faced when storing material in software (in this case, ArtWorks as in Image 4) specifically used for the purpose of building a digital collection as part of the research project. More specifically, although they noted the ease in adding digital information in the database (e.g. by copying and pasting), making this information fit the fixed layout of their final research product (Topical Catalogues) was challenging and time-consuming as the programme did not offer the ability to make relevant adjustments.

> But the advantage of the digital information is that I can copy and paste. And as you may have seen on the screenshots, there is the description. […] So I think I can paste, I don't remember exactly, some 500kb. […] The big issue with that is transferring it into my catalogues. As I mentioned in the comments, it's done manually. Again with copy and paste, but limited of course. Because my catalogue has a certain layout and I have to do it manually there. It would be great to have a database management system with a tailor-made reporting facility. [Participant 06]

Actually, matters such as those mentioned above and several of the ones that follow indicate that scholars have certain expectations and needs when it comes to the ways they store and record information, not least because these practices, which are usually conducted right after the discovery of information, can affect its future use and management.

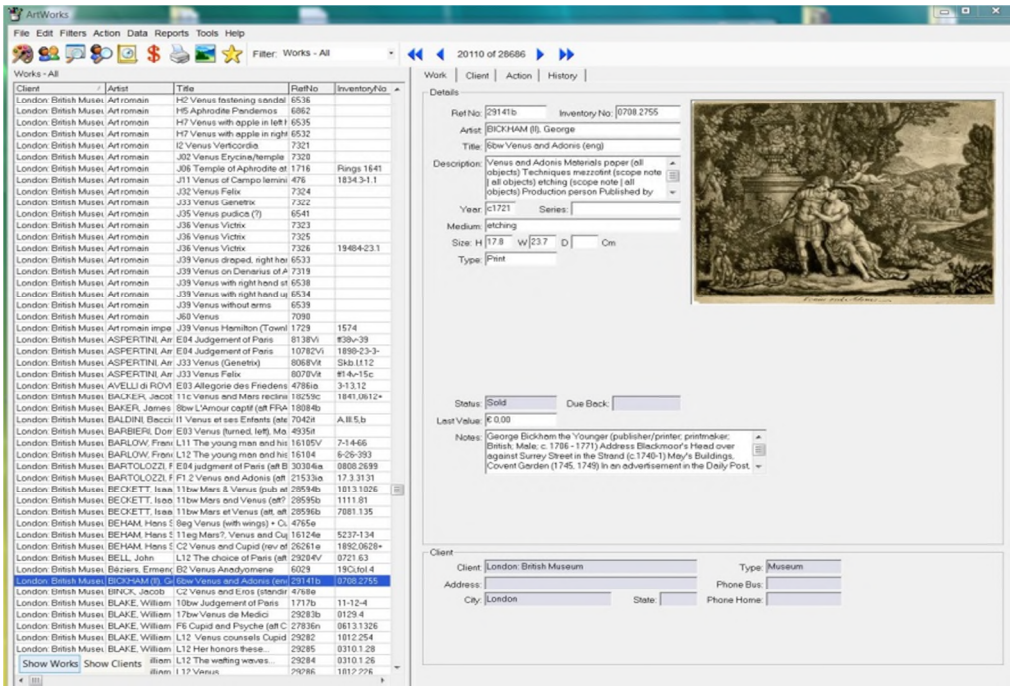


Image 4. Screenshot sent by Participant 06 depicting a data entry in ArtWorks, the software they used in the context of their project.

Thinking in more detail about the needs art historians in this study had when they recorded and stored information related to their research or teaching, the following interview excerpts provide a view of the different purposes particular services, applications and software served when used by these scholars.

> Then I do a lot of sending things to my Kindle for a preliminary read; so rather than just sitting with my screen, I would throw a lot as many research papers as I can on my Kindle. And then I just keep pulling links into the Google doc and pulling resources into something like Evernote. […] I put something I know I need to come back to and work with in Evernote. [Participant 17]

> I've got a recipe on there, which, literally, is that if I start something on Feedly, it goes into Instapaper and I can save it for later on. I use it just as an archive of things I find interesting and I automatically post to Twitter. But the other good thing about Feedly is that it has a set Evernote button- which the Google Reader app that I use on my phone has as well. So, if I'm reading something, whether I've posted it to Twitter or not- which happens more for teaching than for research to be honest-, if there's like an article in a newspaper which is about something that I think is interesting for teaching, I like to send it to Evernote and I use Evernote with my teaching. Then podcasts, it's all the same thing. I use an app called DoggCatcher, just a podcast app for Android and, again, occasionally, there're things that I used for research bizarrely. I mean lots of it is common podcasts and

> stuff, but I have philosophy, I have art history, I have news, I have cultural studies podcasts. And occasionally they will be interesting, so again I clip them to Evernote because it's got a set Evernote function. [Participant 18]

To begin with, it is worthwhile mentioning that Evernote was a type of software preferred by many scholars in this study as they used it for archiving important material for their projects. As Participant 17 and Participant 18 noted, Evernote was the place where they stored interesting information they knew they wanted to use in their research or teaching. Considering the reasons why scholars preferred to use this software, we could argue that these include ease of use, low cost (there is a free version) and flexibility in terms of the types of material that could be stored (e.g. notes, screenshots, other textual and visual material) which could be then tagged, organised and searched based, largely, on personal criteria. Another important factor for its popularity, as we learnt through these participants' accounts, was the integration capabilities it offered with other applications and services, enhancing the opportunities for sharing and re-use.

Apart from that, it seems that scholars increasingly use portable devices (e.g. e-readers, tablets, smartphones) for research or teaching purposes, such as for reading (Participant 17), keeping up to date with the latest news in the field and other areas of interest, or sharing information archived through various applications (Participant 18). Thus, based on the findings so far, it is apparent that scholars will increasingly need tools and services that allow them to keep track of the information stored in different places while providing flexibility in terms of the ways this material is used, such as organised or shared, in order to really facilitate art historical scholarship. Participant 17's comment below makes more explicit the need for such tools and services.

> So, it is building resources and building tools that allow us to work in different ways and allow us to have enough manoeuvrability to change what those ways are; like I store things very differently now to probably a year ago and that would probably be different again in six months' time. So, having that changeability within a tool. [Participant 17]

Thinking particularly about the recording of information through notetaking, apart from the cases where scholars utilised traditional means such as those described previously, there were various other methods employed which are worthwhile examining further. Microsoft Office applications and bibliographic software were commonly used for taking notes.

For example, Participant 01 and 08 used the former for recording textual and visual information.

> Usually by making notes in Word format and, then, downloading the images where possible or, where it's not possible to download the images, to copy the summary and file that again in a Word document, so that it's easy to go back to the original website. Digital images go in the relevant archival folder. [Participant 01]

> Yes, I keep notes in there [in PowerPoint]. And I also use it, for example, to compare the signatures. If the painting has a signature, I zoom it in and then I put it on the PowerPoint and then I can see and compare the different signatures and seals. They tend to work with seals in Japan. So, this is a very useful way for me. Otherwise I print out. I tend to print out everything [laughs]. [Participant 08]

According to Participant 01, the system they followed enabled them to find easily what they wanted after they had gathered the needed information (e.g. revisit the website to check an image that could not be downloaded); however, questions arise with regards to its effectiveness in cases where the collected material increases or when it cannot be referred back to its original source (e.g. problem with website link), bringing to mind Participant 17's concerns about re-visiting the website links archived in the context of their project. Thus, occasions where scholars manage to record and store only part of the required information may lead to new sessions of information seeking in order to locate the original resource. However, the chance of not being able to re-discover easily the information found at an earlier stage of a project can complicate the research process; thinking about Kuhlthau's model (Appendix III), in particular, the user can potentially move from the *collection* stage (sense of direction, confidence) back to the *exploration* stage (confusion, frustration, doubt).

Participant 08, on the other hand, chose PowerPoint as a method for recording information since it allowed them to keep both their visual material and the notes or other textual information about it. The scholar argued that this application enabled them to conduct a comparison (through zooming-in) of particular details of the gathered material (signatures and seals from the Japanese hand-scrolls)- a fundamental practice in the art historical discipline; in the cases where this was not possible, they tended to print out material (see Image 2). Thus, the choice of method for recording information, although not always the most suitable (e.g. due to the non-traditional format of the hand-scrolls), facilitated to some extent the specific needs this scholar had during the research process. Yet, given the fact that this art historian

has previously expressed their lack of confidence in their technological skills, their decision to use one of the applications they engaged with often in their work as researchers, even though for different purposes (e.g. presentations), was largely expected. Finally, regarding this finding, it may be useful to note that it is a good example showcasing the various purposes a tool could serve in the context of art historical research and teaching, especially in cases where other tools and services did not meet scholars' particular needs (e.g. keeping material together or conducting analytical practices like above).

It has been made clear so far that the understanding of the decision making process with regards to the methods and tools scholars choose to carry out particular information and other scholarly practices (e.g. dictated by specific needs, familiarity with particular applications) is essential when developing digital tools and services to support scholarship in the field. Yet, the avenues through which researchers learn about new tools and services can lead to the development of new habits and influence the choice of particular tools when conducting academic work and should also be taken into consideration. For instance, although Participant 08 chose to record information about the visual material based on their familiarity with the application, colleagues constituted the influential factor that led them to alter their notetaking practices concerning textual information; they changed from taking handwritten notes to keeping notes by using bibliographic software (in this case, EndNote).

> Through a fellow PhD student, a friend of mine, I found out how useful it is to use EndNote. Before, I used to take notes, handwritten notes, in the old-fashioned way and then it was hard for me to find them again. So I developed the custom of typing notes straight into the EndNote and it is much easier for me now in the writing up stage to find these notes again. I can just go to the book title and have everything, you know, listed under this one title. But I only found that out through my friend who kindly taught me how to do that [laughs]. So, I wish I would have done that earlier. [Participant 08]

Based on the account of this researcher, the significant role that colleagues play in art historians' work is once again confirmed and, in this case, it goes beyond the exchange of information, to skill teaching. As a result, Participant 08 managed to get acquainted with a new tool which enabled them to use better the data gathered and recorded (their notes on the textual material), despite their lack of confidence in their digital skills. This example suggests that even when there are certain attitudes or similar issues (e.g. lack of awareness regarding re-

sources) that prevent scholars from learning about and employing digital technologies, peer support can prove valuable.

Another issue that was raised by the previous quote is the use of bibliographic software for notetaking purposes, on top of keeping and organising bibliographic references. Participants 07 and 09 below used this type of software as their principal method for taking and keeping their notes in the context of their research projects.

> So, one of the screen grabs that I sent you was of my Bookends which is basically the Mac version of EndNote. I purchased that quite early on; it wasn't very expensive. Basically I use it as my bibliographic kind of archive, but I also record notes in the notes section. […] So, I used that quite religiously to develop the thesis. […] I didn't do anything document-wise, as a way of notetaking. I used that only for actually writing and planning, and keeping notes from supervision. I mostly used Bookends for notetaking. I just felt better knowing that everything was in there. [Participant 07]

> Well, my system with Zotero is, after collecting the references and deciding, each day which is a library day, to go to the library with a set of books I want to work with. After scanning the book or browsing and deciding that I need it, I always open a note in Zotero and within that reference is where I keep my reading notes [Image 5]. It's very systematic actually. And then I'm using the tags. [Participant 09]

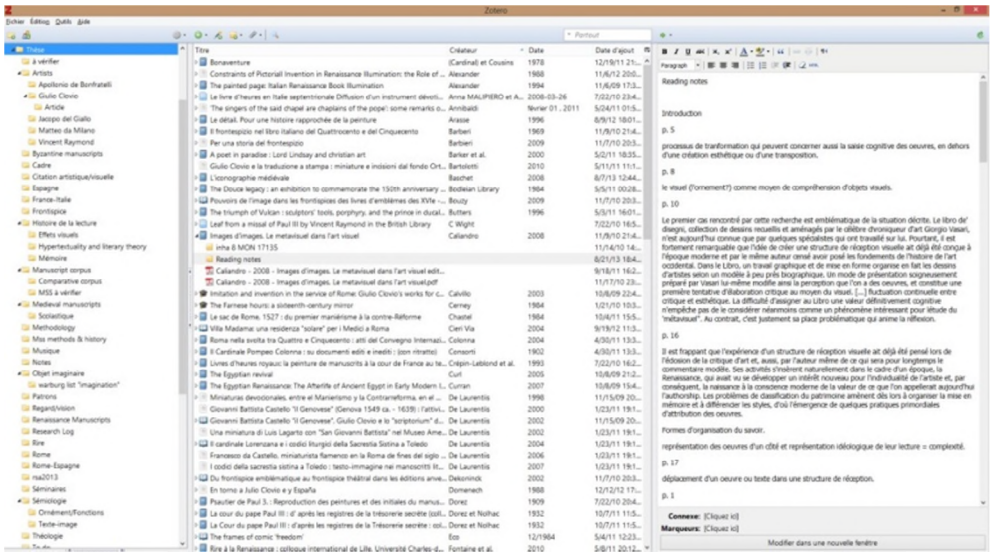


Image 5. Screenshot of a bibliographic entry in Zotero, showing the notes kept by Participant 09 (image sent by the interviewee).

Although these participants used different tools from Participant 08 (Bookends in the former case and Zotero in the latter), their common purpose was to keep their notes together with the related material (mostly textual). According to their comments, this proved to be a useful de-

cision for their research. More specifically, buying Bookends and developing the habit of keeping notes in it early on in their project (as Participant 08 wished they had done), allowed Participant 07 to use the material they gathered more effectively, especially when writing up their thesis.

Also, the fact that this application was used solely for the analytical part of the notetaking activity- and not for its administrative part (e.g. notes from meetings) or for other reasons- increased the confidence of the researcher by knowing that they had all their research material in one place which, in turn, had a positive effect on their work. Participant 09, on the other hand, described the process they followed with regards to the creation and archiving of notes after they had gathered and stored their material in Zotero. Actually, in this case, having everything in one place and being able to search through it by using tags based on personal criteria (as done previously by scholars using Evernote) allowed this scholar to easily find and use the stored material (containing information both about digital and conventional resources) along with the relevant notes.

All in all, after discussing the recording and storing practices of the art historians in the digital environment, certain issues arose around the decision making process with regards to the choice of the most appropriate methods and tools for conducting these activities; these ranged from apparent issues, such as choosing software that is compatible with the devices used (computer or mobile devices) to very particular requirements, like the need to keep all related information together or to employ tools and services that offer integration and personalisation capabilities. Moreover, the influential role of colleagues regarding this aspect of research was also demonstrated. Finally, it was shown that these first steps after the gathering of information could impact the future use and management of the collected material; as a result, scholars tended to utilise tools and services in various ways in order to meet specific needs they had in the context of their projects. In the following sub-section, the practices of scholars related to their physical part of their collections are going to be presented and examined.

7.2 Recording and Storing in the Physical Environment

Despite the increase in the collection of digital information, many of the scholars maintained large collections of printed material along with their digital ones; these collections often entailed material that has been gathered after many years of research (as also in Bake-

well, Beeman and Reese 1988, p. 18). Thus, very often art historians in this study utilised traditional means for recording and storing information, such as conventional notebooks and index cards; different types of folders, binders and plastic sleeves for storing loose leaf papers and various kinds of printouts; boxes and leather cases for keeping material such as notebooks, index cards and slides; filing cabinets and different sizes of bookcases for storing books and other information in conventional formats. For example, Participants 20 and 18 explain how they recorded and stored information by using conventional means.

> I make notes on index cards. And all those boxes are full of postcards [Image 6] that are a backup resource for when I can't find images in my library. Very often I can find things I can scan and use from there. [...] That's probably a generational thing because I'm partly digital, but I still write a lecture by hand. My notes will be by hand. Even though I would write a document on the computer, if I'm writing a lecture, I will do it long hand. [Participant 20]

Image 6. Participant 20's personal workspace, including the boxes mentioned in the quote.

> I use these little field notes books. Have you seen those? They're tiny; small format, brown paper cover- great books. Then I've got a black leather wallet which fits three of those in that and I just literally fill them up sequentially with whatever I'm doing. So, my teaching notes are in there, my notes from meetings are in, my random thoughts about research are in there. Then I've got a little box, again it fits those in, and I just put them in the order I filled them up. That was essentially the first time to do that [unclear]; I'm not the most organised person. I'm not the most systematic art historian at all. [Participant 18]

Based on the accounts of these interviewees, we learn that their physical collections contain material that has been gathered in the context of their current and previous research and teaching projects. Thus, this part of the scholars' collection becomes valuable when the need to remember details of past projects arises or, according to Participant 20, when it is difficult to find the information they want in their computer. In the latter case, it seems that this art historian used their physical collection as a kind of back-up solution and, apart from other types of material, archived information related to the material they kept in digital format. The issue that is worth highlighting here is the fact that this scholar, often, found it easier to discover what they wanted in their physical collection rather than in their digital one; yet, the reasons for that are usually related to the practices and habits of scholars in terms of the organisation, use and management of their physical and digital collections that are going to be examined in detail in the next sub-section.

Concerning Participant 20's (senior scholar) argument that generational differences (mainly habits and training) can be a factor influencing scholars' preference with regards to the format used for recording and storing information (e.g. in this case a conventional medium), the findings did not confirm it. As discussed in the 'Scholarly Working Habits: digital vs. print' sub-section (p. 141), other reasons were usually to do with the preference for working with printed formats. Besides, it became apparent through the interviews that conventional formats could be popular or preferred at times even by participants who were either younger or conducted digital research. Participant 18, although they extensively utilised digital means for storing and recording information, in the quote presented above they appear to use traditional notebooks for recording information related to their projects and daily work routine. It seems that the conventional format and design of the notebooks support the need this scholar has for recoding information in a more intuitive fashion- an issue that came up again in the part of the thesis mentioned above (pp. 138-139) when looking at the art historians' personal workspace. On the other hand, the way Participant 18 described, in the previous subsection (pp. 161-162), using digital means for similar purposes was more strategic (e.g. using applications that could be integrated with other digital services).

Yet, a problem that usually arises when collecting and storing information in conventional format is lack of space. Participant 03, who used two house rooms to store their physical collection, stressed this problem very clearly.

> The only problem is space. Because you can see we're short of it. We actually own this land and we've got a barn that we tried to change it to a sort of bigger study, but I decided against it in the end, because I thought that I would just continue to expand more and more whereas, in fact, in the discipline we are, we should not expand because you lose track of where things are if it gets too big. So, I thought no, I should just keep my room and the room upstairs and the idea of having just one for doing the teaching and one for doing the research. [Participant 03]

Therefore, it becomes apparent that storage space, although experienced in a different way, is a common concern for both those utilising digital and traditional means for recording and storing information. However, this participant's comment regarding the discipline suggests a tendency for collecting large amounts of information (as also found in this study) and the, potentially, chaotic situations that scholars can be confronted with when trying to use the information they have gathered. Actually, as discussed previously, the great variety of material scholars in the discipline need for their projects as well as a number of issues encountered (e.g. access problems or over availability of resources in some areas of study) are some of the reasons for this tendency which can eventually affect scholarly practices regardless of the means used to record and store it.

Examining the practices of scholars in the physical environment provided the chance to observe their habits as well as understand the reasons for storing and recording information in conventional formats. Some of the issues presented also enabled the comparison between scholarly behaviour in the physical and digital environment with regards to this part of research. In the next section, which focuses on the filing and labelling methods used by scholars in this study, we will get a more complete picture of the impact that the information practices presented so far had on scholars' work.

7.3 Filing and Labelling Criteria and Methods

As previously discussed, the art historians in this study followed several approaches for storing and recording the digital and conventional material related to their research and teaching projects. Consequently, filing and labelling were activities that were also conducted when dealing with information in conventional and digital format. Regarding filing, in particular, scholars used either digital filing systems or traditional filing methods to organise the gathered material after storing it by employing the means presented earlier.

Thinking about the criteria for filing digital material by using the computer's filing system, they were often personal (e.g. based on project); the case could differ, though, when software constituted an important part of scholars' information management system. Participants 09 and 06, who employed specific software for storing and organising material in the context of their projects (Google's Picasa and ArtWorks respectively), explained the process of filing, mainly visual, information.

> The thing with Picasa is that you actually see the contents of your hard drive. So, basically, my folders are 'corpus' and 'secondary corpus' and inside you get 'libraries' and then you get folders by shelf-marks and then the file name which is the folio number. So, every time is folio 4 and folio 5. I don't do titles and my files are my file names. It is interesting of course, but for me it does not work for the organisation of my folder. [Participant 09]

> As I told you in the documents, ArtWorks itself has a beta file but I cannot print that out. And then there is an image file which is continuous. So, the only way to find out what I have is to go to that. In the beginning, I didn't index the images like I do now. Now I'm using the automatic reference number by ArtWorks and the name of the artist. [Participant 06]

In both cases, the participants adopted the filing system that the software they were using at the time dictated. Participant 06 mentioned changing their habits in order to adapt to the requirements of this filing system, whereas Participant 09 acknowledged that they do not file visual information based on personal criteria because they could not be applied to the system imposed by the software they used. Although employing a ready-made filing system (or the basis of one) may have its advantages, such as avoiding the information misplacement or retrieval problems that personal criteria can sometimes cause, questions are generated as to the extent to which such a system would be favoured by art historians.

Given the fact that most scholars in this study preferred organising their material based on criteria related to their research or teaching, it is not surprising that only a few interviewees preferred to employ such systems as part of their more general organisation strategies. In fact, the majority of scholars preferred flexibility in the way they organised information; even in the previous cases, these filing systems were only part of more complex organisational systems which included the management of other types of digital as well as conventional material. However, it is worthwhile mentioning that the above participants were categorised as conducting digital research and they were generally comfortable in using the computer as part of

their research projects (even though Participant 06 expressed their preference for reading in printed formats in the 'Scholarly Working Habits: digital vs. print' sub-section, p. 135).

To continue, many of the participants employed traditional methods for filing information in printed and other conventional formats. Participants 11, 03 and 20, below, provide us a view of their approaches with regards to this aspect of their personal collections.

> I tend to keep material I photocopy from archives. I will always keep it together, I won't try to integrate it into any other filing system because at least I know then that if I sort it in one particular archive, it will be in that one [emphasized] box. [Participant 11]

> If I Xerox a paper I'll write a card index for it and I'll file that under the name of the author, occasionally a file under something else which is not very obvious, and I have those alphabetically so I can look those up. I also have lists of my box files, these box files down here and I've got more upstairs, and so I'm getting through that. And also within the box files to certain areas that I work for a lot- like these months I'm interested in Marches. [Participant 03]

> I keep the photocopies of articles and sections of books that I don't possess for future reference. I have a filing card system which is in those plastic packets because when I study for my teaching point of view, I tend to make notes from photocopied articles or from books, so that is easily digestible and easily portable. You can take them with you and consult them. [Participant 20]

According to these quotes, an issue that becomes apparent is that a large amount of the printed information scholars file (except from other conventional material, such as slides) consists of photocopied material that they do not possess (e.g. in the case of Participant 20), collected during their visits at archives (e.g. as Participant 11 noted) and libraries around the world. Since this material is of vital importance to these art historians' work and, often difficult to access, scholars take particular care when filing and organising it. For example, Participant 11 mentioned filing this kind of material in boxes based on archive and keeping it separately from any other types of printed information in order to be able to use it effectively.

Concerning the practices of Participants 03 and 20, they both employed a card indexing system for keeping track of the printed material they had archived; such systems were fa-

voured mainly by senior scholars who have been using them for many years.[128] Yet, again, index cards constituted only part of the larger organisational systems that art historians followed for research and teaching purposes. The format of the index cards which allowed only concise pieces of information to be written along with the portability factor that this choice entailed were considered to be two of the main advantages of this system; actually, this led to ease of discovery and use of the material in the related part of this scholar's collection.

All in all, although most of the scholars kept both digital and physical personal collections, it was clear that those with large physical collections often needed to utilise a combination of methods and means for filing and organising information. However, even when scholars used a great deal of traditional means for conducting such practices, their filing criteria did not differ much from those who employed principally the computer for doing so (except from the examples where the software used did not allow for much flexibility). Thus, as we will discuss later in more detail, the principles followed were mostly related to their research and teaching projects as well as to longstanding habits, like the use of index cards.

Labelling, as a practice, was consequently conducted both in the digital and physical environment. Art historians in this study mentioned labelling particularly the folders and files related to the textual and visual material they had gathered or created in the context of their teaching and research. To begin with, Participants 02 and 13, below, provide an idea of the rationale behind the labelling strategy they chose to follow with regards to their digital filing systems.

> It will be a straightforward, meaningful name. Usually I will arrange the information. I will use a kind of hierarchy, which works for me. Anything to do with teaching will be just week by week, class by class. More general subjects may be organised differently. [Participant 02]

> So, every bigger file, it's got a more general term. So, I have, for example, one big file that's says PhD and, inside, it begins to break down. I have the file on artists, I have the file on background literature, I have the file on, let's say, personal writing or interviews. Then, when you go within those, there's another set of files specifically by name or by date in some cases as well. So, if it's for the writing, then it'll be by date, and, subsequently, inside them, there might be another sub-file with something more and more specific. And I found it quite helpful to do it that way. I can very quickly,

[128] Yet, as previously mentioned (see p. 141), the preference for using conventional formats for conducting these activities was not restricted to this group of scholars.

> for example, now open my computer and figure out immediately, by just looking at it visually, what would belong where [Participant 13].

Generally speaking, one of the principal concerns of scholars in this study when it comes to organising their personal collections was to be able to discover easily the files they had archived whenever they needed them. As Participant 13 noted, using meaningful names and a structure based on specific criteria enabled them to quickly locate the information they needed 'by just looking at it'. Given that information files in the digital environment do not usually offer the visual stimuli that information in conventional forms, such as a book with a colourful cover, do, labelling becomes an important activity in maintaining a well organised personal collection; as we learnt previously (e.g. see pp. 134-135), due to this aspect, conventional formats can more easily trigger memory and, therefore, influence scholars' preference with regards to the material they collect and work with. Participant 11's remark can help us better understand this argument.

> I used to actually do it by journal title, so all the essays I had from Modernism/Modernity would be one and all the ones I have from Oxford Art Journal would be under Oxford Art Journal and so and so. That was like a legacy of seeing these things in print and actually what I was doing when I was going around and collecting essays that I'd seen in Modernism and Modernity two or three years prior and so I knew what the publication was. Once you get to the stage where you are just constantly reading essays on databases on the Internet, I know which the great essays are, but I can't tell you which journal they appeared in anymore. [Participant 11]

As becomes apparent through the above quote, labelling and organising material cannot always be equally successful by following the same habits in the digital and physical space. More specifically, scholars often need to apply different criteria in each environment in order to find and use effectively the information they have collected. Moreover, this interviewee's observation adds to previous comments with regards to visual memory and its role in the work of many of the art historians in this study. Although we will look at memory and its role in the organisational practices of scholars in the next chapter, it may be useful at this point to stress the limited capabilities offered by existing digital storage systems when it comes to filing information (especially textual) in ways that could be useful to different groups of users; filing based on visual attributes (e.g. colour, shape or images) could potentially prove useful to users, such as art historians, who rely heavily on their visual memory in order to find, use and manage information.

As Case (1991b, p. 667) argued when examining the organisational patterns and retrieval of textual information by historians, information systems need to '[…] facilitate recognition of files through the addition of richer contextual cues […]', taking into consideration issues such as form or quality, in order to trigger memory and enhance scholarly work. Yet, even though the technology has progressed greatly since Case's study, it seems that researchers who rely significantly on memory in their daily work routine, like many of the art historians in this study, are not aware of tools, such as those described by Case, which could, eventually, enable them to conduct basic information management practices more efficiently. Given that information practices such as filing and labelling can significantly affect the use of the gathered information (as will be shown later in this sub-section) and the lack of studies looking at these aspects of art historians' behaviour, this thesis's findings will contribute to the better understanding of the way scholars handle information as well as the distinct needs they have when conducting practices like these.

In general, it was very common to separate the research and teaching material by using different folders with indicative labels; for example, Participant 13 named their general folder containing the material related to their research as 'PhD', while Participant 04 had a teaching folder named 'BA3' (see Image 7). Beyond these initial general folders, there was often a hierarchy of secondary folders and files, with the labels moving from the general to the specific as the information they contained also tended to do so; in fact, labelling (especially of the folders) was often closely linked to the organisation criteria of each participant and subject to any changes that occurred due to the organic nature of research (more information will be provided in the next two sub-sections).

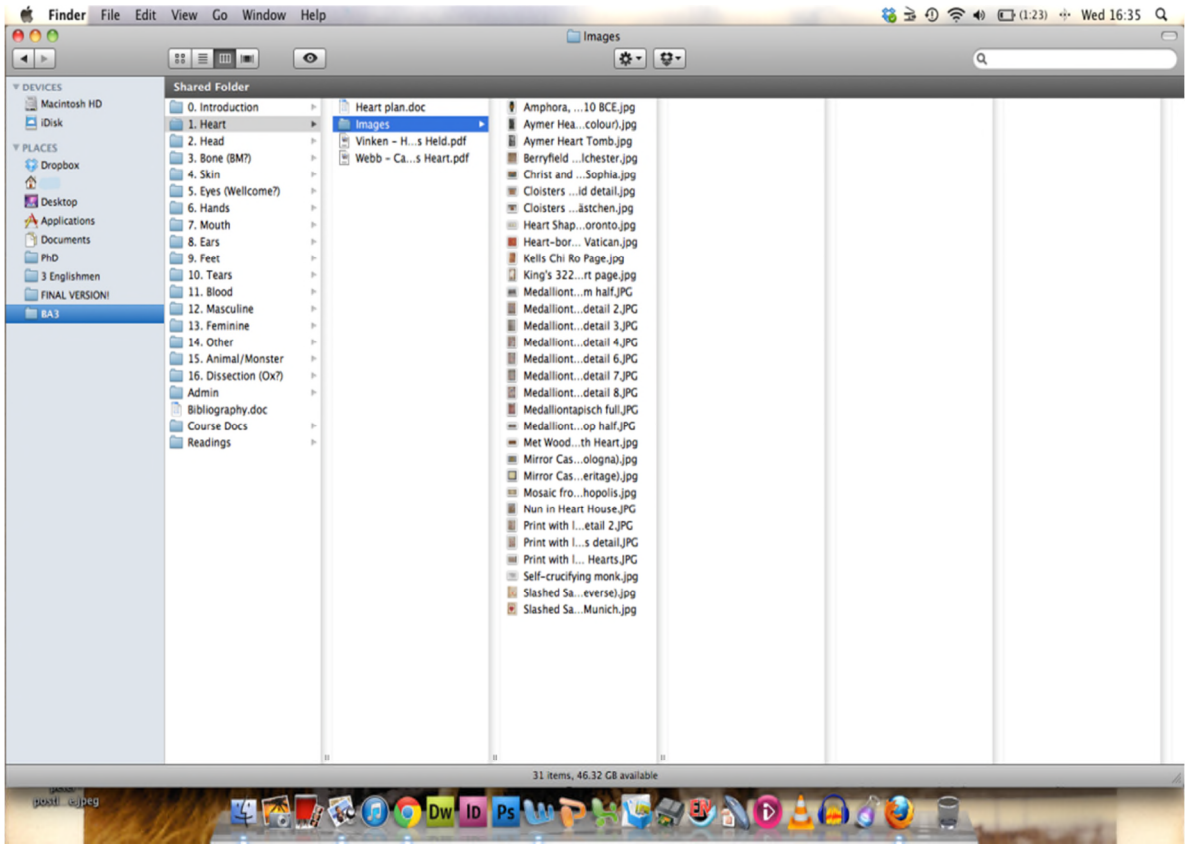


Image 7. Picture sent by Participant 04 showing the structure of one of their teaching folders (image edited for data protection reasons – the participant's name next to the 'home' icon in the navigation panel was erased).

Thinking about the textual files within these folders, such as documents and pdfs collected from various places, they were labelled with information related to their official titles, names of author(s) and dates. On the other hand, documents and drafts compiled during research generally had names related to the progress of a scholar's work, indicating the contents of the document or including other pieces of information that could be understood by the scholar. Art historians in this study raised particularly the issue of the names of pdfs downloaded from resources like JSTOR which included non-descriptive information, such as numbers; in such cases, they tended to change the label according to their needs.

As for the images, their labels could include information varying from the name of the artist to a brief description of an object, including its date and place. It is worthwhile noting Participant 10's account, where they stressed the importance of using labels based on the official names of art objects in order to be easily cross-referenced to the related literature. Being able to easily relate one's files to the works of others constitutes, according to Case (1991b, p. 662), one of the two principal factors scholars take into account when organising information, with the other being the effective use of the collected material.

> So, for example, if there's an Oxford University collection drawing, I'll call it 'Oxford study' in jpg. I usually label them according to the location where they're at. […] And I should add that this mirrors the way these items are referred to in the literature, so it's not something I'm making up myself; in terms of the drawings, for example, they generally tend to refer to them by the Institution that is the current possessor of them. [Participant 10]

Moreover, even though there were participants who found it too time consuming to change the labels of the images, others paid extra attention in documenting the information in relation to the visual material. For example, Participant 11 mentioned adding relevant details under the properties of an image file, a habit that enabled them not only to easily locate the image, but to also retrieve other useful information, such as the resource where they had initially found it.

> Under properties, I put where I've got the image, so I'm actually quite meticulous about this now, because I'm fed up with having images that I just don't know where I got them from. So, now when I get a new image wherever it's from, I put in the properties where it's come from and how I know it's what it is and things like that. So, it's more complicated than it's used to be, but hopefully better in terms of trying to trace things. [Participant 11]

The source of an image is often a vital piece of information that art historians have to remember both for referencing it and confirming its copyright status when needed, such as for a publication. In fact, based on Participants 11's account of their need for storing important details along with the files they gather (especially the image files), database software could be a more suitable solution for their needs. However, the complexity of this type of software as well as the advanced skills that are often required did not persuade this scholar to employ it.

Also, it is worth noting that studies around the management of personal image collections have argued that, although database software (mainly query-based system) offers strong searching possibilities, many users do not find it useful for browsing and analysing material such as images (e.g. see Elsweiler, Ruthven and Jones, 2007; Graham et al. 2002). More specifically, as image collections grow, users find it harder to locate material through searching and more time has to be spent in adding key information manually, making this type of system less appealing (Jónsson et al., 2015, p. 345; Graham et al. 2002, p. 1). Thus, research is being conducted on alternative methods for managing image collections at a personal level, such as automatic classification of images based on certain attributes (e.g. the time images are cap-

tured, colour) or tagging; more detailed accounts of related issues can be found at Jónsson et al. (2015), Chen (2010), Elsweiler, Ruthven and Jones (2007), Platt, Czerwinski and Field (2003), Graham et al. (2002).

Furthermore, there were occasions when the strategies scholars employed did not seem to work perfectly and, thus, they needed to be re-visited. Participants 01 and 07 talked about the challenges they faced with regards to the labelling of their files.

> I would have just been far more rigid and methodical about the labelling of folders and files and individual images, so that it was easier to be sure that when I did a word search I had actually pulled up all the data. [Participant 01]

> So, I think about in my third year, I was 'Oh, my God!'. It was actually getting really difficult to find images. So, up until that point I've been looking at them in terms of chronology. I would know in my head that the first time I went to Granada I took these pictures and I'd be like 'Ok, I'll just go to that album and I'll find them', which was getting ridiculous by the end. So, I did actually spend a couple of days labelling stuff, so then I would just search stuff. [Participant 07]

According to these art historians, the labelling approaches they followed right after they had gathered their material caused problems in re-discovering this information at a later stage of their research. Actually, as Participant 07 argued, as their research project progressed and the material being added constantly increased, a detailed labelling plan became a necessity in order to be able to find the information they needed each time they used their digital personal collection. Similarly, Participant 01 realised that there was a need to revisit their strategy and label the individual files inside the folders in a way that would make them easily retrievable.

It may help to remember that scholars often look for inspiration in their personal collections when planning future projects; yet, if they cannot fully exploit the breadth of information they have collected, it will probably affect their research choices. Another good example is Soper's study (1976)[129] who, after examining scholars' personal collections in the sciences, social sciences and the Arts and Humanities, found that most of the citations in researchers' published work came from the material existing in their collections. Thus, a sound organisational and labelling strategy conceived at the beginning of collection building, which

[129] As mentioned before (e.g. see 'Literature Review' chapter), this is one of the few studies looking on scholars' personal collections and, thus, despite its age, it is of importance for the current research.

allows for flexibility as the project develops, can have a positive effect on scholars' work whether they employ a particular computer programme or not.

Regarding labelling the material in their physical personal collections, scholars tended to write brief notes on the labels of folders and other traditional storing and filing means they used or to put labels on them (e.g. on the shelves, as in Image 8) for categorising conventional material, such as books, journals and photocopies, and finding more easily what they needed. Unlike digital information, though, the visual attributes of traditional formats often meant that they were easily distinguishable even without labelling; for instance, art historians in this study who kept physical collections, generally, remembered where they could find the information they needed based on cues such as the colour or size of a box, the colour of a book or its position on a self.

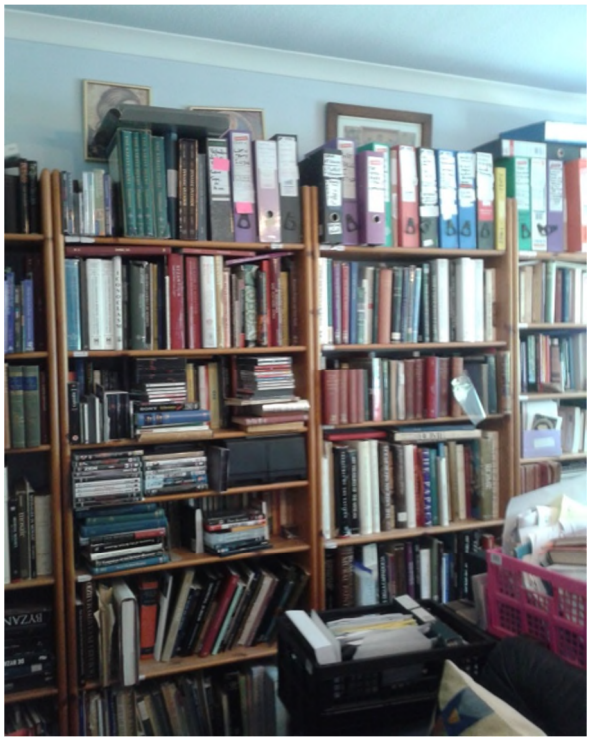


Image 8. Part of Participant 03's physical personal collection with white labels fixed on the edges of the shelves and other storing and filing means.

However, even though material in conventional formats, like books, can be discerned with ease, there may be cases where things get difficult to find. On these occasions, having some kind of systematic organisation can contribute significantly in tracking things down; findings showed that scholars' labelling strategies were frequently part of complex organisational systems which, as we will see in the next sub-section, could differ from those employed in the digital environment or be combined with them.

To conclude, it is evident that filing and labelling were important steps in the process art historians in this study followed for efficiently organising their research and teaching material. Scholars often started conducting these practices early on in a project, right after they had gathered and stored the necessary information, and continued doing so long afterwards; yet, the initial strategy employed each time, or the lack of it, could affect the future use of this information. For instance, as collections grew, insufficient filing and labelling systems could constitute an additional challenge for scholars when attempting to trace the material they had gathered and the resources they had consulted. Finally, by exploring the practices of art historians in this study with regards to filing and labelling in the digital and physical environment, we had the chance to get a view of their habits as well as the challenges they faced at this part of their scholarly work; the importance of such practices will become clearer after we examine scholars' organisational behaviour in the following sub-section.

7.4 Findings Summary

The analysis of the research data in this chapter showed that, when possible, there was a tendency to store and record information digitally. As became apparent during the presentation of the storing, recording, filing, and labelling habits of art historians, flexibility was one of the main features that scholars looked for when choosing a digital tool to use; lack of customisation functionalities was often a reason for choosing to use more familiar tools in diverse ways instead of experimenting with new ones. Tools that allowed scholars to work in visual ways were also considered important as they were found to facilitate memory which, as argued before, is an important characteristic of scholarship in art history. Moreover, it was shown that these first steps after the gathering of information could impact the future use and management of the collected material; as a result, scholars tended to utilise tools and services in various ways in order to meet specific needs they had in the context of their projects.

Thus, it has been made clear so far that the understanding of the decision making process with regards to the methods and tools scholars choose to carry out particular information and other scholarly practices (e.g. dictated by specific needs, familiarity with particular applications) is essential when developing digital tools and services to support scholarship in the field. However, it should be noted that the avenues through which researchers learn about new tools and services, along with other influential factors (e.g. colleagues), should also be taken into consideration when introducing tools targeted to art historians.

Finally, we learnt that scholars' physical research collections contained material that had been gathered as part of current and previous research and teaching projects. Physical collections were found to be particularly useful for accessing information about past projects or finding material that was difficult to locate in the computer (e.g. through keeping physical copies). Although most of the scholars kept both digital and physical personal collections, it was clear that those with large physical collections often needed to utilise a combination of methods and means for storing, recording, filing, and labelling information. Yet, there were issues, such as storage space, which constituted common concerns for both those utilising digital and traditional means for recording and storing information.

CHAPTER 8: MANAGING AND USING PERSONAL COLLECTIONS

This part of the thesis will focus on the management and use of personal research collections by the art historians participating in this study, as it emerged through the interviews and observation conducted in the context of this research. More specifically, the practices related to the organisation, use and management for the purposes of research and teaching in the field as well as the difficulties faced by scholars will constitute the main points of interest at this stage. As part of this discussion, we will also look at the tools scholars employed for these purposes and attempt to draw the implications for resource design. Furthermore, we will have the chance to present and analyse the data around the value of personal research collections and look at their role in the scholarly workflow. Finally, where needed, this section will include some of the interviewees' beliefs and attitudes with regards to the issues noted above or to any more general, but related, disciplinary matters that were mentioned during the interviews.

8.1 Organising Information: practices, tools, challenges

As mentioned in the previous chapter, separating research from teaching was one of the prevalent methods scholars employed for structuring their personal collections. However, while the separation between research and teaching material was found to occur quite often in the digital environment, all but two (Participants 03 and 07) of the scholars following this approach did not do the same where their physical personal collections were concerned. As will be shown later, this behaviour was rather common for scholars who kept both digital and physical collections, since the organisation criteria they followed were usually different in the two environments.

However, although making a distinction between the research and teaching material was a frequently employed strategy, some of the art historians commented particularly on the overlap of information that could occur between the pertinent folders. Participant 02 and 17, below, refer to their experiences with regards to this issue.

> There is overlap definitely. For example, with my interest in haptics I will be looking at any information which may be useful for my personal re-

> search or collaboration. But what I need for teaching must be in a digested way. Because of time constraints and syllabus constraints, I need a few good examples, a few good case studies, some theoretical framework with the possibility for the students to research the topic further. It will be usually digested from something larger. [Participant 02]

> I keep separate files for teaching and research. And there's crossover a bit. I mean, intuitively at some point I separated research and teaching out in terms of how I store it, but I will store the same items in both places. And then with tools like Evernote and tools like Prezi you can actually cross-reference quite easily. […] But I think Word forces you to work in a particular way and it takes a while for you to realise that's that a counter intuitive way of doing it. So, my Word files are separate but on as many other platforms. It's a lot more blurred and I would either store the same thing across different locations or have one location and just mix it all together. [Participant 17]

Generally speaking, it was quite common for scholars to utilise the wealth of information they gathered or created in the context of their research projects for teaching or other activities as well. As these participants confirmed, despite the separate folders, the need for easy access to material used for these two main purposes (research and teaching) caused an overlap of information. However, Participant 17 highlighted the fact that, by using software such as Evernote or Prezi, they could easily cross-reference between their research and teaching material. They argued that, in that way, the need for storing duplicate files was eliminated while the diversity in the use of the material increased, things which could not be achieved by employing other more broadly used programmes, such as Microsoft Word.

As became apparent earlier (see. pp. 162-166), art historians in this study regularly used applications, software and other programmes for purposes in addition to those they were originally designed for, in an attempt to link information, make it easily retrievable and increase usability; thus, it comes as no surprise that scholars would go beyond the original purpose of such tools and use them for organisational reasons too. Based on Participant 02's and 17's accounts, cross-referencing and multi-use of information are two needs which can be found in the practice of other art historians in this study as well. In general, duplication of files was a practice followed by many scholars participating in this research in order to meet the needs described above; yet, this method of organisation can be the cause of errors and other problems, such as the loss of information, which, in the long run, could prove inefficient and counter-productive. Therefore, equipping scholars with appropriate digital tools and services, which could be adapted to their organisational needs, would potentially have a positive effect

on other core scholarly practices, like writing and publishing. As Participant 02 further elaborated, keeping all the related material together can be crucial for conducting such practices.

> It is always led by the research goals of the specific project. […] So, whether this is an image, which I do terrible things to in Photoshop, or it's a quotation, or even the entire article or e-book, I will keep it with all associated information that allows me to re-use and publish. [Participant 02]

Before examining, though, the relationship between organisation and scholarly practices, it is important to present the most common criteria followed by art historians in this study for organising parts of their collections associated with research or teaching. Thinking about digital information gathered or collected, principally, for research purposes, as we were also informed through the above quote, scholars frequently organised their files based on projects as it enabled scholars to keep related material together. Yet, other organisational approaches (e.g. for sub-folders) included grouping material together based on institutions (academic or cultural institutions); art objects and monuments; topics and themes studied; material; people; resources; research trips, places and events; artistic periods and movements or other criteria based on the art historians' research projects and interests. Concerning teaching practice and the related material in scholars' digital personal collections, it is worth adding to the earlier comments that it was quite common to organise it according to criteria such as institutions, courses, chronological order of classes or topics taught.

Regarding digital images, apart from being grouped in folders organised according to the criteria presented above, it was the type of material which, along with bibliographic references, was more likely to be managed through the use of software. Although other kinds of material, like podcasts, videos and web links could also be managed by using digital tools and services like the ones discussed in the 'Digital Storage and Recording Practices and Media' sub-section, visual and bibliographic information was what most scholars tended to use or wished to use management software for. Generally speaking, when the digital tools and services employed for organisation purposes allowed scholars to create their own categories, often by tagging or grouping the material in folders, the criteria followed were similar to those applied to parts of their digital collections organised through the computer's digital filing system.

Therefore, whenever art historians used software for managing images, they preferred tools which were closer to image viewers than databases since it enabled them to conduct core activities, like image comparison or grouping of their material (see, the first collection 'Mon-

tages comparatifs' in Image 9), in a more intuitive and user-friendly way (as Participant 09 explains below).

> So, anyway, coming back to Picasa, it was always my choice. I wasn't looking for something like FileMaker and complicated databases because I wanted it to be visual. I guess this is something that has to do with the personal choice, because people function differently and I always knew that I function visually because I could actually visualize how I wanted it to be and this is what I looked for online. […] I basically use it for manuscript images and secondary visual resources and then one of the big, big advantages of Picasa is the montage which allows me to compare and combine different material in an intuitive manner [Image 09]. [Participant 09]

Actually, what we learn through this interview excerpt confirms our previous arguments on art historians' requirements considering digital tools and services for conducting various information practices (e.g. see p. 162). Thus, based on these scholars' preferences for software, *user friendly* describes a digital tool or service with simple interface and basic features that facilitates the need for interaction with information in visual ways; allows for personal criteria to be applied; is easy to learn; compatible with their devices and, potentially, with other programmes; does not entail complex technical processes for its operation and is not costly.

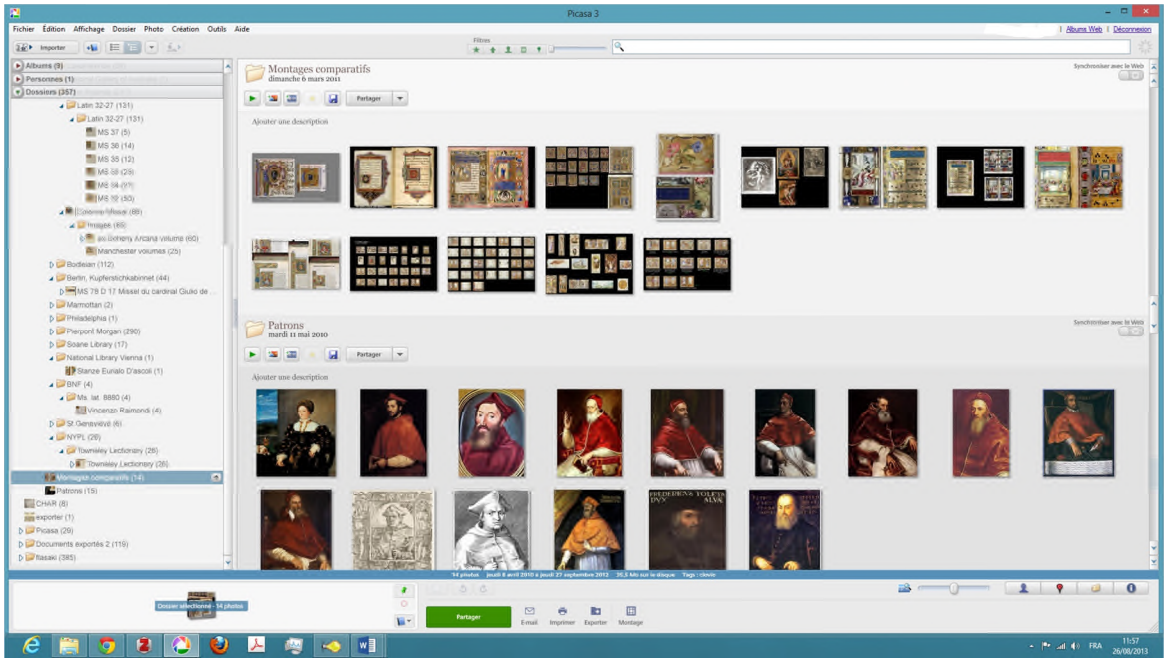


Image 09. Screenshot sent by Participant 09 depicting part of their image collection in Picasa (image edited for data protection reasons - the participant's email was erased from the top right corner of the image).

However, as we have already discussed, some of the scholars in this study used database software for image management purposes; their accounts reflect the limited opportunities offered by this type of software for applying personal criteria to the management of the material. For example, earlier in the thesis (p. 160), Participant 06 referred to the challenges they met when storing information in ArtWorks due to the layout of the interface. Participant 12 also mentioned finding it difficult to familiarise themselves with the layout of FileMaker Pro when managing their visual material.

> I mean, I'm using a template [see Image 10] and I'm still struggling. But you just have to do it, right? Some of my colleagues use PowerPoint, but you can't really search in PowerPoint. [Participant 12]

Before continuing, though, it may be useful to remember that in both of these cases the creation of a database containing visual material was part of the aim of the participants' projects. Since these art historians had to capture very particular information about the images they had gathered, they decided to employ tools that would allow them to document their material in detail. Yet, although their chosen tools enabled them to add important metadata related to their material, the interface and the available functions were either complex for scholars to learn (e.g. in the case of Participant 12) or they did not offer much choice for personalisation in order to allow them to analyse their data more effectively (e.g. through intuitively connecting information or, as Participant 06 wished, generating reports).

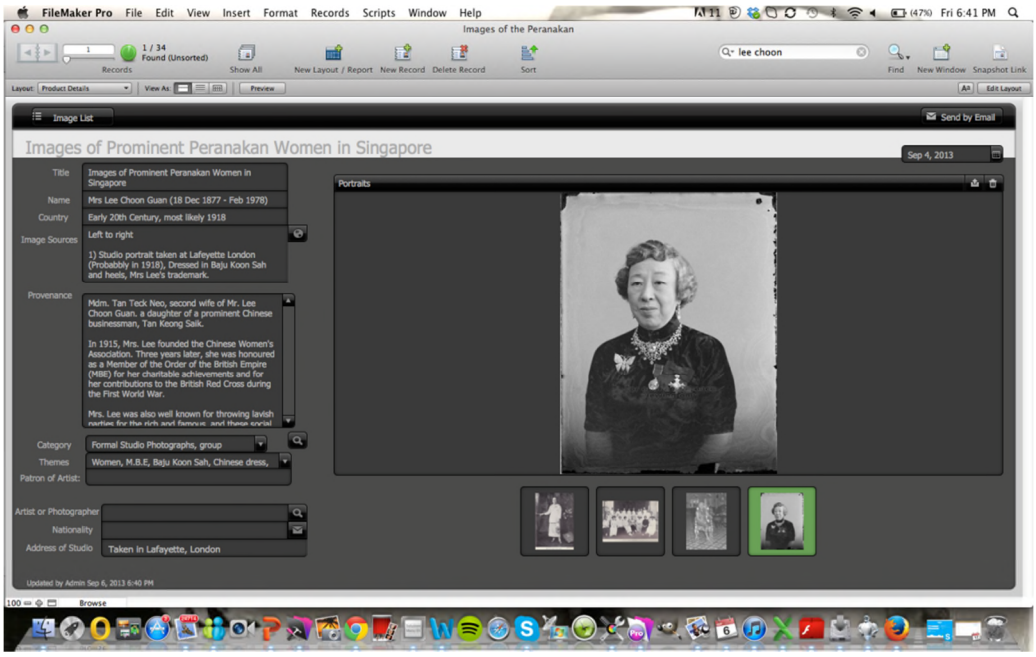


Image 10. Screenshot sent by Participant 12 depicting a data entry in FileMaker Pro, the software they used in the context of their project.

Indeed, despite the fact that database software offers more capabilities in terms of searching through the material (as Participant 12 also argued), sorting it according to specific criteria (yet, mostly pre-defined) or analysing it (e.g. through visualisation), it seems that the complexity of such a tool along with the cost and the advanced technical skills that are often required did not convince most of the scholars in this study to employ it for information management purposes (as it was also the case with Participant 11, p. 176). It is also worth noting that a more complex tool may entail various technical processes for ensuring its preservation and efficient use which, in the case that the product is discontinued or the technical support stops, can pose extra challenges to scholars managing their collection of material through it; Participant 06 encountered this problem.

> The problem of course [unclear] now is that it's no longer updated or supported. I am still in contact with the designers, so there is no problem for the next few years. But if I want to preserve my collection for maybe some PhD students [laughs], I would like to move on with another software. It's not that easy I think. [Participant 06]

Moreover, concerning scholars' organisational strategies with regards to images, it is worth noting Participant 20's approach for organising their material which was based on the structure of an institutional slide library. In the following quote, this art historian gives more details about their chosen system for managing digital images.

> And this is driven by the way that the slide library of the London Institute I studied [name of Institute removed] used to be organised. That's the organisation that I use. I have a file which is then divided into materials essentially. So metal work, mosaic, panel paintings, architecture; although increasingly I file items associated with a building within the architecture file. So, within the architecture I then divide into countries. [Participant 20]

Regarding this example, it can be instantly observed that the organisational criteria entailed in this approach, related to disciplinary topics and interests, are quite similar to those employed by scholars in this study who did not employ an institutional approach to their organisational systems. However, this can be easily explained if we consider the structure of academic libraries, whose collections are organised to a great extent according to disciplinary criteria and needs, or the time that many of the art historians in this study had spent researching in them, while also getting accustomed to their structures. In the case of this scholar, it can also be argued that, having spent quite a lot of time in that library (e.g. as a student), its organisational system has become part of their memory. As it will be shown later (p. 194), a place where

learning takes place (e.g. a library) facilitates the creation of connections between information which, then, contribute to memory (Case 1991b, p. 665); thus, adopting a system upon which a part of their knowledge has been built constitutes an efficient way for this art historian to organise their material, ensuring its easy retrieval and use.

Being familiar with the way that an institutional collection close to a scholar's interests is organised can be indeed an advantage when it comes to managing material in personal collections, as its structure can constitute an excellent template for associated activities which, sometimes, are challenging or time consuming for scholars to conduct. The need for institutions to support scholars with information management issues in the digital age was also stressed by Brockman et al. (2001, p. 32) and Beaudoin and Brady (2011, p. 32). Hence, academic libraries, apart from being access and content providers, may have also a role to play in forming scholarly behaviour concerning information management in the digital age; independent art historians (like Participant 20 above) and other scholars without institutional support, especially, may value relevant services.

For example, involving art historians (e.g. PhD students or senior scholars) in the process of creating digital resources (e.g. to be used by visual arts scholars) would enable them to get acquainted with how digital collections and repositories are structured; this knowledge can then be channelled into their personal collections and information management behaviour. A similar argument was made by Battin and Stam in as early as 1989 (p. 23); their suggestion involved the incorporation of library-oriented training into art history courses. This type of training could equip scholars with the necessary knowledge to tackle any problems encountered in the management of their visual material.

However, later studies looking at the information behaviour of Arts and Humanities scholars have found that attendance at departmental and library technical training sessions tends to be limited with the most common reasons being lack of time, the lack of a system that rewards professional development through learning digital skills or the, often, generic nature of many of those sessions. Thus, many of the researchers interested in advancing their technical skills either attempt to learn on their own or consult their colleagues (e.g. see Warwick et al. 2006, p. 57; Research Information Network 2008, p. 20; Long and Schonfeld 2014, p. 48; Antonijević 2015, pp. 84-85).

Thinking about the current study's results, it was mostly the art historians who were confident about their technical skills who experimented with new tools and services. On the

other hand, those who did not consider themselves particularly tech-savvy, including many PhD students and independent scholars (e.g. see p. 140), either turned to their institutions and other cultural organisations for advice and examples (e.g. see Participant 20 above and Participant 04 below) or attempted to conduct any day-to-day tasks with the tools already familiar to them (digital or analogue). Scholars from both categories, though, valued colleagues' expertise and reported engaging in discussions and knowledge exchange regarding best practices to manage information either through one-to-one sessions (see p. 164) or in groups during conferences and events (as in the case of Participant 17 below). Participants 04's and 17's accounts illustrate how many of the scholars in this study learnt about digital tools and services.

> Any knowledge I have for these things [tools for managing information] comes through my colleagues and through the institution. [Participant 04]

> When I was in North Europe [name of country removed], at a Digital Humanities Centre [name of Centre removed], one of the things I organised while I was there was a sharing session on tools. We were all just given five minutes to talk about a tool that we were using to help us in our research. And that was really valuable actually because we were coming from different disciplines. [Participant 17]

Yet, although receiving relevant training and support (either by colleagues or institutions) could help researchers learn the basic functions of a tool or service that was previously unknown to them, many of the participants still faced difficulties when attempting to use a tool more creatively or to conduct important tasks in the context of their projects (e.g. see p. 185 for Participant 12). Based on this finding, it was argued that most of the tools and services scholars utilised in the digital environment did not meet their needs in terms of the personalisation choices offered and task fluidity.

This, then, leads to the assumption that if digital tools and services are not built to adapt to scholars' needs, the training and support will only be helpful to art historians up to a limited extent (if they decide to attend training sessions or ask for advice). Yet, even if digital tools and services are improved, scholars will probably still rely on their home and other institutions (e.g. academic libraries) as well as on their colleagues for finding information about them and learning which tool would be best for their work. It is worth noting that Antonijević and Stern Cahoy (2014, p. 293) recently found that their Arts and Humanities research participants envisaged libraries as playing a key role in data management and digital archiving in the immediate future.

By forming collaborations with art history departments, information professionals could play a key role in updating researchers about the most appropriate tools and services to use as well as on best practices for the documentation and preservation of scholars' personal collections. As Long and Schonfeld argued:

> 'Few art historians receive any formal training about proper digitisation, photography, image quality, digital preservation, or digital projection. They cannot always evaluate the quality of a digital image or assess the best way to display it. Moreover, they often fail to take advantage of tools for storing and retrieving their collections' (2014, p. 47).

Many information professionals working in research libraries, archives and museums are dealing with issues around digitisation, management and preservation of information on a daily basis; comprehensive discussions on these topics can be found in Deegan and Tanner (2002), Hughes (2004) and Ruthven and Chowdhury (2015). As one of the preferred methods of art historians to capture and digitise information is through their digital cameras, learning about relevant procedures and guidelines employed by memory institutions may prove helpful to their work with information. More specifically, it is worth getting familiar with issues around the digitisation and management of image collections which will ensure the longevity of scholars' valuable image collections; in fact, many of the criteria and processes (from capturing to storing information long term) involved in building and managing institutional image collections are not very different from those employed at a personal level (e.g. see Terras 2008, p. 153).

In the cases where further support through training is needed, this should be tailored to the art historians' needs. As became evident through the accounts of scholars who undertook institutional training with regards to information management tools and services, it was important for them to be able to relate what they had learnt during a session to their own area of study and personal work; however, since these sessions were of a more general nature, this was not always possible. As a result, resorting to colleagues for examples and advice on how to use specific tools and services was a more fruitful endeavour (though, as said before, only to a limited extent given the tool restrictions); hence, integrating peer-learning into the training system may be an option worth considering (as also in Bulger et al. 2011, p. 75).

Moreover, as Participant 04 noted, the time they find about a tool can affect the decision making process with regards to its adoption.

> I think, actually, rather than what it would be or what it would do, the thing that would most interest me is when you gave it to me. I think it would be really important, if I was actually to use it effectively, that it was given to me at the beginning of my research project. [Participant 04]

This interviewee's comment may also suggest that scholars could be open to exploring various digital tools and services as long as they can consider the choices they have early in their work and plan their projects accordingly. Therefore, besides the need to understand art historians' needs in terms of the technical requirements that technologies like information management software should meet in order to be useful to researchers, it is essential for tool providers as well as academic and other institutions to take into account issues like this when building or introducing related digital tools and services to scholars in the discipline.

Supporting scholars with regards to this aspect of their work will not only positively affect academic research, but it can also prove beneficial for institutions. Based on our findings (more information on pp. 206-208), there were art historians interested in sharing material from their collections with other scholars and institutions, like museums and libraries; the development of collaborations between art historians and institutions could potentially profit both parties, with the former contributing content and expertise to existing collections and the latter facilitating the preservation of the digital material of scholars' collections.

Considering other issues that the interviewees raised during this part of the discussion (beyond those associated with software capabilities and technical skills), these were often related to reasons like duplication, problematic synchronisation of files across devices and platforms or miss-labelling of files (the impact of which was discussed on pp. 173-174) as well as to problems such as the lack of the ability to search through the large amount of the collected information according to various criteria or to cross-reference between different types of material (an essential practice as seen, also, on pp. 175, 182).

Actually, an interesting point regarding information organisation and management is that issues such as cross-referencing have been on art historians' wish list since Bakewell, Beeman and Reese's study in 1988, which was conducted in the context of the Getty's *Art History Information Program (AHIP)*. More specifically, the authors, then, stressed the need their interviewees had for linking visual and textual information along with other matters they found to be of significance, such as the request for flexibility in adapting organisational tools to personal criteria and the necessity to sustain the connection between gathered information and its source (Bakewell, Beeman and Reese 1988, p. 54). They also argued that by meeting

needs like these, art historians could use effectively the data in their collections for the purposes of current and future projects.

Thus, although technology has progressed greatly since that study was conducted (e.g. computers have become more 'user friendly' and, thus, widely adopted for personal use while digital tools and services are now available for all levels of users), the fact that our research brought up similar issues showcases that art historians today still lack access to tools and services that satisfy some of their essential information management needs. Since the technical requirements needed to meet scholars' expectations with regards to appropriate tools and services could be easily attained, our findings suggest that the problem may lay elsewhere. As mentioned in the literature review, most of the studies so far looking at the art historians' information needs have focused on their information seeking behaviour, with only brief references to scholars' information management habits. Hence, one of the reasons that could explain why researchers in the field still express the same wishes as thirty years ago is the limited understanding of the practices they conduct 'behind the scenes', at their personal workspace. Findings like this also raise the importance of the current thesis, which examines aspects of this part of scholarly behaviour, and calls for further research on the scholarly practices that follow the discovery of information (e.g. information management).

Apart from the above issues, there were occasions where scholars found themselves facing additional challenges with regards to the management of information which had to do with matters concerning the type and format of the material; mailing lists or art objects which were categorised in the methodology section of this thesis as non-traditional (e.g. online artworks or non-Western art objects, like Japanese scrolls) posed obstacles for scholars dealing with them that could not be easily overcome. For example, Participant 17, a digital art historian, described their concern regarding the project they were working on at the time.

> But part of the nature of a lot of things that I've spent my time researching is that I won't be able to find them maybe in a few years' time anyway. So, that's why I'm trying to contextualise them now so there's at least some metanarrative, I guess, on what was there even if it's not there later on. But it's not easy. At the moment, at the online discussion I'm hosting, it got very busy very early on and all my plans for just copying and pasting conversations into a Word doc completely fell by the wayside. [...] So, it's not easy and it might be a useful project to work out a way of archiving and working with mailing lists material, but I might find it in five years' time that nobody is working from mailing materials. [Participant 17]

According to this participant, the type and, often, the ephemeral nature of the data with which they worked constituted a challenge when it came to archiving (in a Word document) and re-using it. Given that the increase in the use of digital technologies by art historians will result in more research conducted with various types of data in digital format (e.g. mailing lists, social media, online artworks or computer-generated data), there is a necessity to assist scholars with regards to the management of these types of information.

Archiving and managing material constitutes an integral part of the research process which can facilitate or, if problematically conducted, hinder other core scholarly practices, such as the synthesis of information and the production of the research argument. Hence, tools that make it easier for scholars to store, organise and (re-)use such types of data at a later stage of their research or in future work through, for example, offering the flexibility to adapt to possible changes in the data format could prove especially useful to art historians working in the context of digital projects. At this point, it is necessary to note that participants working on digital projects were not aware of such a tool that could be used for information management purposes; yet, based on their expressed needs, a tool that would enable them to store and manage non-traditional information objects (as described above) should work independently of their format while not requiring the user to conduct complex processes. This tool should also meet the criteria mentioned previously with regards to the functionalities that allow scholars to use and analyse their data effectively.

Generally speaking, those who employed software for keeping and managing references usually followed the criteria they had adopted for organising other parts of their personal collections (e.g. according to themes or projects through creating folders or tagging), while some of them used it for additional purposes too (e.g. notetaking as on pp. 165-166). However, there were participants who did not find such tools useful either because they found it challenging to familiarise themselves with the way a tool like this worked or because it did not meet their particular needs. For instance, Participant 17 provided a pertinent example which further illustrated the challenges that can be met when dealing with non-traditional information; it should be mentioned that this interviewee chose, as a result, to follow a more conventional way of managing references which was to keep them in the documents they wrote (as many other art historians did).

> So there might be an instance where a YouTube video is maybe an artwork, but maybe it's commentary on something or maybe it's a parody. [...] It's a difficulty because it means that you're imposing a structure on

> materials that don't fit that structure. You can describe it the way you want to in your work but, then, when you come to put that in a bibliography or a citation, you have to impose a structure over that that makes no sense. [Participant 17]

This scholar also went on to explain why they decided not to use EndNote while conducting their PhD (their previous project); as much of the material they worked with in the context of their project (e.g. online artworks) did not fit the format of the pre-defined metadata fields, this tool was not regarded as a suitable choice. As they mentioned at another point, the standardised and non-flexible structure of many digital tools and services is not appropriate for handling material in formats which constantly change, like digital material, an observation which brings us back to our earlier comments about the challenges imposed by the type and format of digital data. These issues demonstrate once more the necessity to increase our knowledge about scholarly practices conducted in the context of non-traditional research, some aspects of which this thesis has attempted to identify and understand.

Continuing, scholars' organisational approaches when dealing with physical personal collections of considerable size involved complex methods as well. As discussed when presenting the habits of scholars with regards to digital and printed material, there were interviewees who focused mostly on maintaining a well-organised collection in the digital environment. However, those with large physical collections, who either preferred or relied largely on printed resources, had developed detailed strategies for dealing with material in traditional formats and using it effectively along with the digital part of their collection.

To begin with, it is worthwhile noting that some of the criteria employed by art historians when categorising digital information were not considered suitable for the purpose of organising material in traditional formats. For example, features pertinent to the materiality of traditional information objects, such as the size of a book, had to be taken into account when deciding on an organisational approach; a factor that was not regarded as relevant when sorting digital material. Additionally, in the physical environment, organisation based on alphabetical or chronological order was not deemed necessary unless material like photocopies, printouts and handwritten notes was concerned. Therefore, the arrangement of material in traditional formats was most commonly done according to types and series of information objects, topics and themes, types of art objects and materials, institutions and place.

It is no coincidence, though, that scholars' organisational systems in the physical environment were often found to work better than the digital ones (e.g. for finding information).

Having already discussed the impact that certain information practices, especially when problematically conducted, in the digital environment (e.g. labelling) can have on the use of information and, as a result, on the work of scholars, it is of no surprise that art historians with large physical collections found it easier to manage and work with them. Participant 03, for example, explained quite clearly why managing and using their physical collection was easier for them.

> I see my study as a sort of extension of my brain in which the material is organised rather in the way my brain is organised- that is with the ability to make lots of connections across different areas. I sort of feel very happy with it because of that. [...] I mean of course it would be better if it was tidier and stuff like this, but being tidier doesn't seem to be making things more accessible- that's for me. [Participant 03]

Based on this art historian's account, the physical format of the material enabled them to be creatively messier and organise the information they had in their collection based on criteria linked to their area of study, research experience and scholarly practice. Although some of the scholars who employed principally the computer for managing their material also compared their organisational approaches to the way their mind worked, they usually referred to parts of their collections which were sorted according to their own criteria (e.g. organisation according to research trips) rather than to those whose organisation was directed by the principles of particular software (e.g. through pre-defined fields).

Case, while exploring the role of memory in the organisational practices of historians, argued that 'one of the worst things that could happen to a scholar would be for a stranger to "tidy up" their office' (1991b, p. 665). By drawing on human memory and learning theories, he underlined that the environment where such information practices take place plays an important role in the learning process. During these practices, the connections that are created between information aid learning and, through that, memory; thus, any changes to the related environment can affect the cognitive process and cause performance issues. On the other hand, the inflexible nature of many digital tools and services used for these purposes, which do not allow scholars to work intuitively with information (e.g. by making connections) or apply personal criteria, prevents learning and hinders memory; it is not surprising, then, that many scholars prefer to utilise traditional material for such purposes.

Moreover, Case noted that recognition is a vital part of organising information; having things '[…] in view and close at hand' (1991b, p. 665) is very important for triggering recog-

nition and, thus, memory, while visual and tactile signs also contribute to this purpose. Theories on *Personal Information Management (PIM)* also support this argument. For example, Jones in 2007 argued that '[…] one way to aid memory is to keep items in view' (2007, p. 469) while recognition is high when conducting practices such as naming information objects and making relevant connections which, in turn, make this information memorable; yet, according to several examples presented in this study, it became apparent that the physical environment offered more cues and better opportunities for performing tasks that facilitated recognition and memory.

Hence, in the context of this study, it was clear that the art historians who used conventional material extensively for the purposes of their projects valued the flexibility it offered when managing this part of their collections as well as the resulting advantages to their work through, for example, facilitating their memory. However, it should be mentioned that there were scholars, working largely with digital information, who also acknowledged this positive aspect of the physical material. For example, Participant 18 below, while describing the connection between their memory and certain characteristics (in this case, colour) of the conventional material in their collection, confirmed earlier arguments on the effect that visual cues, found in the physical environment, can have on scholars' practice.

> I tend to keep a lot on my head. It all comes together at the end when I'm writing surrounded by piles of paper and post-it notes and like 'Where's that file?' [...] But, yes, I have this weird memory when I'm like 'Ok, that piece of paper is in a red folder' or 'that piece of paper is in a yellow folder' or 'That piece of information is in a book with a purple cover about half way through'. [Participant 18]

More specifically, despite their claims of a less structured approach to their personal collection, it seems that this scholar's visual memory played a key role in finding and using information during parts of the research process where it was necessary to do so, such as the writing stage. As has been previously shown through several examples in this thesis (e.g. see pp. 173-174), visual memory, in particular, constituted an important part of scholars' practice, from the finding of information to its management and use.

Thus, even though Brilliant's argument that digital technologies will '[…] extend the visual memory of all art historians […]' (1988, p. 125)[130] when it comes to art objects,

[130] Although this is an old reference, it is one of the few that highlights the importance of this quality (memory) in art historians' work.

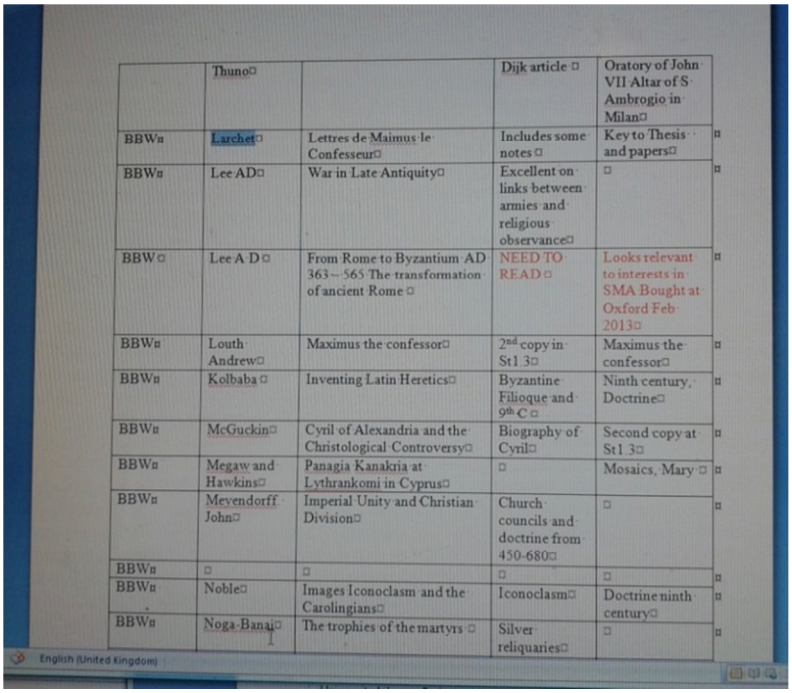
through access to large numbers of high quality digital images and tools to interact with them, has proved largely true,[131] the development of the field (new areas of study and methodologies) and the great amount of information that scholars deal with requires the use of their memory beyond the mere recall of an art object. More specifically, according to the current study's findings, art historians needed to use their memory in order to create connections between different types and formats of material, often, while developing new skills (e.g. if software was entailed), an issue which was less of a concern thirty years ago. However, the challenges scholars met and the issues they raised when using tools and services for these purposes demonstrated that part of Brilliant's argument has still not proven true; unless digital tools and services allow scholars to be flexible and creative in the (re-)use of the material they gather and create (e.g. by making various connections), they will not effectively facilitate this quality and, consequently, several aspects of scholarly practice (e.g. the analysis of this information in the digital environment).

Continuing, although teaching, as explained at the beginning of the section, was not usually taken into consideration when deciding on the criteria for organising a physical collection and any slide collections (only few scholars mentioned still having one) were not as elaborately sorted as in the computer, where conventional material was concerned, there was an additional organisational approach which is worth noting. More specifically, it was quite common for scholars to separate the physical material they were working on at the time from that less or not needed. This method of organising information which was based on scholars' practice at a particular point in the course of a project was employed mostly in the physical environment (e.g. by keeping the material on the desk or at shelves close at hand) and only occasionally conducted in the digital (e.g. by copying and pasting information on the desktop screen); its main goal was to remind scholars of the work that needed to be done and the physicality of the material often worked as a visual stimulus that facilitated this.[132] As the analysis of scholars' habits in their physical personal workspace also revealed, keeping information in view (e.g. images on a board above the desk in the case of Participant 12, see Image 3) could not only trigger memory but inspiration as well.

[131] Thinking, though, about the related tools that scholars in this study used or, sometimes, the lack of them (as has also been discussed in various cases throughout the thesis), it was evident that finding user friendly tools which facilitate art historians' practices associated with images is an area that needs further improvement.
[132] Case in 1991b (p. 662) noted a similar behaviour when studying historians' organisational practices.

Generally speaking, although problems could be encountered when managing physical material (e.g. misplacement of information), scholars were usually able to locate what they wanted based on their memory and the organisational strategies they had developed by grouping material according to specific criteria. Yet, there were two scholars, Participants 03 and 16, who attempted to tackle any problems in the use of digital and physical information by developing their own systems for connecting digital and physical information or used the digital facilities to facilitate the process of finding information in the physical environment.

Actually, Participant 03 had developed a digital indexing system (Image 11), which when used along with their conventional card system, allowed them to keep track of the information existing in their physical collection. More specifically, after inventing their own abbreviations corresponding to specific parts of their physical collections (e.g. in Image 11, BBW means Bookcase By Window), they logged them inside the cells of a table created in a Word document (first column). Then, in the rest of the cells, they added information they considered important, like the name of the author (second column), title of printed resource (third column) as well as short notes about the material, commentary with regards to its usefulness for the project or information that acted as a reminder for activities and other issues (fourth and fifth columns).



	Thuno		Dijk article	Oratory of John VII Altar of S Ambrogio in Milan
BBW	Larchet	Lettres de Maimus le Confesseur	Includes some notes	Key to Thesis and papers
BBW	Lee AD	War in Late Antiquity	Excellent on links between armies and religious observance	
BBW	Lee A D	From Rome to Byzantium AD 363 – 565 The transformation of ancient Rome	NEED TO READ	Looks relevant to interests in SMA Bought at Oxford Feb 2013
BBW	Louth Andrew	Maximus the confessor	2nd copy in St1.3	Maximus the confessor
BBW	Kolbaba	Inventing Latin Heretics	Byzantine Filioque and 9th C	Ninth century, Doctrine
BBW	McGuckin	Cyril of Alexandria and the Christological Controversy	Biography of Cyril	Second copy at St1.3
BBW	Megaw and Hawkins	Panagia Kanakria at Lythrankomi in Cyprus		Mosaics, Mary
BBW	Meyendorff John	Imperial Unity and Christian Division	Church councils and doctrine from 450-680	
BBW				
BBW	Noble	Images Iconoclasm and the Carolingians	Iconoclasm	Doctrine ninth century
BBW	Noga-Banai	The trophies of the martyrs	Silver reliquaries	

English (United Kingdom)

Image 11. Page from Participant 03's digital indexing system created in a Word document (image cropped and quality enhanced).

Similarly, Participant 16 attempted to track information in their physical collection through the use of Word documents on their computer; however, in this case, they mostly noted down information in the form of bibliographies.

> There is the paper stuff and there's the stuff on the computer which is divided up by folders. So, in a way I've got two systems, but I try to keep a hand on each of them by having these Word files which act as bibliographies. So, that I know what I've got in each thing basically. [Participant 16]

Although these systems were of great help to researchers when they needed to track down information in their physical collections or to cross-reference digital and conventional material, keeping them manually updated could be a challenging task. Given the organic nature of research and the changes in the organisational structures that often followed the development of a project (e.g. the constant increase of information in scholars' collections as we will see in the next section), systems like Participant 03's and 16's would require frequent updates by hand in order to be used efficiently; a time consuming task and the cause of potential errors that could affect the material's re-discovery and re-usability.

Apart from a tool that would permit the easy cross-reference of information, some of the interviewees expressed the need for a tool that would enable them to know what kinds of information they have in their collections (both digital and physical), e.g. through generating a chart so that they could note any gaps in their collections. However, even if a tool like this could be provided, it should meet the criteria described earlier (e.g. ease of use, p. 184) in order for more scholars to be able to employ it, while in the case where professional training (e.g. in using the tool) and support (e.g. advice on how to include information derived from the physical personal collections) are offered, the requirements discussed earlier should also be taken into account (see p. 189). As scholars become increasingly aware of the need to manage their growing digital collections or keep track of the digital and conventional types of information they have in order to use it more effectively (as Participants 03 and 16 did previously), such a tool would not only contribute towards successful information management, but would also enable them to move their practice forward through, for example, noting tendencies in information that was hard to see before.

To conclude, in this section, the organisational practices of scholars in the digital and physical environment were explored and the criteria they employed for managing the information in their personal collections were presented. By examining the challenges faced during

these practices, an attempt was made to understand any requirements scholars had as well as to provide ideas for relevant tools and services. Finally, we had the chance to look in more detail at the role of memory in this aspect of scholars' work and make suggestions for further research. The next section will focus on the role of personal information collections in research and teaching and aim to understand the value these have for scholars in the field.

8.2 The Value of Personal Collections: using and sharing information

Previous studies have stressed the significant role that personal collections played in the work of this group of scholars and underlined the reliance they often developed upon them due to regular problems such as limited access to digital resources and high quality images or copyright issues (e.g. see Challener 1999, pp. 45-46; Larkin 2010, pp. 49, 52; Beaudoin and Brady 2011, pp. 29-30). The art historians that took part in the interviews conducted for this thesis confirmed that their personal collections had a central part in their practice as researchers; Participants 11's and 20's comments below illustrate this argument.

> At some point in the last twenty years I have read at least 80% of those books and I do know what's in them. So, in a way that means they almost determine how my mind works as well. They are the corpus of stuff I read [emphasized]; how I go about being an art historian is very much influenced by a load of stuff that's in those books. [Participant 11]

> If I'm starting something from scratch, sometimes I'll go right the way back to my MA notes, in my PhD notes and utilise the whole pool of different material; so, that little pile of stuff down there. I guess, when I'm writing something, I just get out a pile of books and use that in conjunction with resources on my computer. [Participant 20]

These excerpts provide an idea of the reasons why the collections that scholars built are of special significance to them. Participant 11, for instance, explained how the material they have collected and read over the years has shaped the way they work as an art historian. On the other hand, Participant 20 referred to the usefulness of both parts (digital and physical) of their collection in each project they undertake; indeed, earlier in this thesis (p. 118), personal collections were found to be one of the first places where scholars looked for information at the beginning of a project.

It is worth noting Participant 11's reference to the material in their personal collection as the 'corpus' of information that has influenced their practice. As we saw earlier, Participant

09 organised their digital image collection by using the word 'corpus' as part of their category system (see p. 170 in this thesis). Generally speaking, a corpus constitutes a collection of written texts, including an author's complete work or a body of writing on a specific topic.[133] Corpus based research has been very common in Arts and Humanities and Social Sciences disciplines as it enables scholars to draw more accurate conclusions about a particular subject through examining a substantial group of data. For example, corpora of written or spoken material in a computerised and structured form are widely used by linguists to understand issues around language, such as how it changes over time (e.g. see Litosseliti 2017). Additionally, digital corpora are useful tools, especially, for text-based digital humanities scholarship where a variety of digital methods, such text and data mining and analysis, can be used to answer research questions not possible to explore through the use of conventional collections (e.g. see Fischer 2017; Tonkin and Tourte 2016; Lin 2012).

At the beginnings of art history, a corpus of objects considered of high significance based on certain criteria (e.g. execution) constituted a form of a 'canon' of idealised objects worth studying and using as a comparison tool; yet, as the discipline developed, this was debated and the interest of the field shifted to almost all aspects of material culture (e.g. see Preziosi 2009, p. 8; Harris 2001, p. 10). For the art historian, some of the core analytical interpretations are based on the use of corpora of works of art. For instance, by examining all known works of an artist, a scholar can understand how their style evolved over time while, by comparing an art object to a larger group of artworks, a researcher can draw conclusions about whether this fits a specific art movement (e.g. see Preziosi 2009, p. 8). In the digital age, the word 'corpora' is also used to describe born-digital or digitised collections that include not only texts, but also images and other materials, such as videos, which can constitute useful sets of information for the traditional and digital art historian (e.g. Marmor 2016; Salomon 2014; Drucker 2013).

In this thesis, the word 'corpus' was mostly used to refer to the personal collections that art historians were building as part of their professional practice (e.g. Participant 11, Participant 16), to specific parts of these collections created for a particular project (e.g. Participant 09) or to groups of information collected to support a project's goals (e.g. Participant 12 used the word 'corpus' to refer to the textual information collected as context for the images in the database they were building as part of their research). On the one hand, the use of this

[133] See the English Oxford Living Dictionaries, https://en.oxforddictionaries.com/definition/corpus.

term by the art historians in this study showed that the notion of building a 'corpus' of information to work on a research project, develop an argument or to draw conclusions on a specific topic is part of scholarly practice in the field. Yet, the fact that the word 'corpus' was also used in connection to the impact that these collected groups of information have on the development of their professional identity as scholars confirmed the value that art historians place on their personal collections.

Regarding the quote by Participant 20, it also informs us how and when this scholar used the collected material: in the beginning of the project and at the writing stage. Although some of the participants mentioned constantly referring back to the material they had gathered during the period of a project, most of the art historians tended to re-visit and use (e.g. re-read) it more frequently either at the beginning or in the last stages of a project. The writing stage, especially, was noted as the time when it was most important for them to consult again the gathered information in order to refresh their memory, get inspiration for structuring their argument or confirm references and other details.

Yet, the type of project in which scholars were involved at the time could determine how frequently they re-visited their collections; for example, in the context of a longer project, like a PhD, participants needed to use their collection more often in order to accomplish certain tasks (e.g. write the report for upgrading from MPhil to PhD).[134] Generally speaking, though, Participant 04's account can be considered a good example of how scholars used their collections over the period of a project.

> Yes, the beginning and the end. So, at the beginning I'll be reading works and making notes on them or looking at objects and thinking about how they'll fit in my argument. And then I'll go away and do all of that. And I suppose I'll still be reading different things as I go along. But I guess regarding the images especially, because once I've seen them I've got an idea of them, I don't refer back to them. And this time, I suppose, with the text, once I've read it and filled it in, I won't go back to read it again- until, with my thesis, right at the end. [Participant 04]

However, as the projects developed and during the stages when scholars re-visited their collections to conduct certain practices, it was quite common to make changes to the structure, mostly, of their digital collections. Participant 09 described the changes they made in their Picasa and Zotero collections and explained the reasons for doing so.

[134] A process which takes place in UK universities, usually, near the middle of a PhD project.

> The first time that this happened was when my collection of images grew very big and I still had not decided on a system. I think I did this last year. I had in Picasa both folders with shelf-marks and folders with the name of the manuscript and it began to get a bit difficult to handle. And this is when I decided to do that corpus library; shelf-mark and folio number system. And then in Zotero, if you look at the image I sent you, you have a folder named Master2 and then right below you have Thèse. Now, the Master2, you cannot see it right now, but it has folders such as other manuscripts, research log, to do, to read again, and wish list. And that was all. All the references and all my MA is in the parent folder Master2. You get everything there and one of the most important folders was the research log which basically contains only notes that have to do with my personal thoughts. Then you see that this changed when I began my thesis. In the first place, I replicated this system, but it didn't work for me because suddenly the themes and topics I was treating were much more important. And this is where I decided to do the thematic organisation of the folders. [Participant 09]

The above quote demonstrates the strong connection existing between the development of a research project and the structure of a personal collection; as the information collected for the purposes of a project increases, the need for re-organising the collection in order to use it effectively emerges. It is worthwhile noting the changes that occurred in this interviewee's Zotero collection as they moved to their new project (PhD) and their understanding of their research topic grew; the structure of their Zotero collection shifted from being project based to being thematic. Concerning digital tools and services for the organisational practices of art historians, it is worth restating that flexibility should be a principal characteristic of such tools if they are to support scholars' needs in structuring, re-structuring and, consequently, using their collections successfully. Actually, Beeman in 1995 (p. 96) noted that the ideal system would take into consideration the organic quality of art historians' research collections.

However, besides re-organising parts of their collections as their project progressed, the art historians in this study often found the need to conduct certain practices with the purpose of facilitating the research process and making good use of the gathered information. Moreover, it is worth stating that these activities could lead to the development of new habits; this argument becomes more evident in the following quote from the interview with Participant 07.

> So, I started keeping a list of journals and archives, all my resources, and I just put those in bookmarks in Safari [browser]. I have a tab on my browser that there's specifically for online engines and databases and things like

> that. So, I started keeping that pretty early on when I realised that there are a lot of stuff that you're not going to remember; what the name of that article is and so on. And that was really useful. I still use it all the time. [Participant 07]

According to this scholar's account, after collecting the necessary material for their project and progressing their work, they faced the need not only to manage the constantly increasing information but also to make sure that they would not lose track of the sources where they had found it (this need was also identified and discussed earlier when looking at the filing and labelling behaviour of scholars on p. 202); thus, they developed the habit of saving the relevant websites as bookmarks in their browser.

Hence, during the stages when a research project was in progress and the need to use the gathered information was high, scholars had to take particular decisions and, potentially, develop new work habits which could involve the use of digital technologies. For example, there were scholars in this study who were thinking of employing digital tools and services at a later stage of their research project (e.g. Participant 18 considered employing a reference manager) as they believed that their adoption would be necessary in order to manage and use effectively the information in their collections. Although we were earlier informed (by Participant 04, p. 190) that the initial phases of research may be better for scholars to learn about digital technologies that can be used for research or information management purposes (e.g. due to larger time availability), the stages when they have to take action with regards to the information they have in their collections (as in the case of Participant 07 above) may be the ones when they are more likely to start using them; yet, we have already shown that if a tool is complicated and time consuming to learn, an alternative (probably a familiar one) will be preferred.

Apart from using them for research purposes, though, personal collections were a valuable tool for teaching as well. Participant 20 and 13 describe how they used the material they had in their collections in class.

> I have a digital image database on my laptop and I also increasingly use my iPad to download specific images which I use as adjuncts for gallery teaching. So, when I need a comparison or a view that can't be seen from the viewpoint that the object has been exhibited from, I will pass my iPad around. [Participant 20]

> If I'm doing any other kind of project like teaching, for example, I'll go quite often into my own research and pull out relevant articles that I'll up-

> load online for the students or include into the PowerPoint presentation if it's images and things like that. [Participant 13]

More specifically, Participant 20 utilised part of their collections in combination with their iPad for tackling specific problems during class in a gallery, such as the need to provide alternative digital examples for comparison when there are no physical ones available. On the other hand, Participant 13 shared information from their collection with students and used their visual material when presenting in class. Most importantly, though, these quotes demonstrate how scholars re-use their collections for different purposes, highlighting the vital role that personal collections play in scholarly practice and justifying the value that they have for their owners.

However, this value seems to increase if we consider the additional use of the personal collections revealed by Participant 10 below, which is that of a diplomatic tool.

> It is my personal collection, of course, but I share it as part of the project and, once I actually put it online and established a way to access it, I was quite happy to share with other scholars and sort of use it as a diplomatic thing as well. You know, as an exchange with other scholars. If they've given me a resource that was rare or difficult, I'll give them access to something I have which is rare and not part of their collection; because I've found that I have a much more extensive collection than anyone else I've encountered at this stage. [Participant 10]

Actually, if we take into account that this interviewee was an independent scholar, it becomes evident that their personal collection was a tool for overcoming various difficulties that this group of scholars was likely to face, like problematic access to information, through networking and sharing.

Regarding sharing information, in particular, there was a mixed response by art historians in this study when asked about this potential use of their personal collections. Most of the interviewees were quite keen on sharing bibliographic references or secondary sources and material, but they were more hesitant where primary and visual data was concerned. A similar behaviour was observed with regards to digital and printed material where the latter was considered more valuable; as Participant 11 stated, they would be happy to share information in digital format, but not books from their physical collection.

> I'll send electronic files to anybody who wants them. […] And other people have done that for me as well and there is no problem there at all.

> Books, it's a completely [emphasized] different matter for me [laughs]. My books are mine, I don't lend them; I don't lend them to students, I don't lend them to colleagues. [Participant 11]

Since primary resources, necessary for conducting research in several disciplinary areas, were still difficult to find and access, the material that scholars managed to gather after their trips to archives, libraries and museums around the world was considered too precious to make readily available to others. Also, part of the participants' physical collections often consisted of expensive or rare printed resources, issues which justify their reluctance. Considering the visual material, especially, the cost of acquiring it and scholars' uncertainty with regards its copyright status were two additional reasons which prevented them from sharing it.

Apart from these issues, though, some of the younger researchers in this study were particularly concerned about the effect that sharing could have on their future career; Participant 04's remark when asked about the possibility of sharing information from their collection reflects the perspective of several art historians who were PhD students or early career researchers.

> This is a difficult question to answer because it varies. If you are talking about fellow researchers who I know personally, or who I have worked with or spoken alongside at conferences I am generally very happy to share, collaborate, and am generous with my own images, resources, and writing. If the subject area in question is far enough away from mine I would even be happy to share information and images with researchers who have emailed me out of the blue, or who I don't know personally. However, it's very difficult for an early career researcher to judge how the sharing of information could impact on areas close to your research. This information represents not only several years of work, but also information for the vital publications that will hopefully lead to eventual employment. As a result, I am slightly more guarded. [Participant 04]

As becomes evident through this quote, the material that art historians have gathered over the years not only constitutes the means for supporting current and future projects, but also plays a key role in scholars' career plan; as Participant 04 explained, information in their personal collection could lead to future employment through using it for publications, an essential practice for progressing in academia. Moreover, although our interviewees, like this art historian, were keener to share information with colleagues closer to them than unknown scholars, things were different when considering unpublished work; actually, only Participant 17 (a digital art historian) was open to sharing work in progress since they regarded it as a good way of

getting feedback from colleagues which could benefit their own work. Also, the hesitance towards sharing information that was thought to be of importance to scholars' projects, such as images, was partly based on fears of revealing aspects of their work to others before managing to publish it. However, given that publications are vital for academic success, and since a sharing attitude is not officially rewarded by the current academic system, being overprotective about one's work is not surprising.

On the other hand, there were scholars who were very positive towards the idea of sharing in general. Participant 18, for example, highlighted the importance of developing a sharing culture in academia and commented on the existing beliefs often surrounding this issue in the art historical discipline, confirming the previous argument.

> In terms of sharing, I'm so up for sharing and stuff like that, but I know some people are very rigid about that and they'll be finding it very, very difficult, especially if they are working on something, they think you'll take their ideas. […] So, yes, I find quite sad sometimes some people say to me 'Oh, you know, I've got…' and they don't want to share their stuff or they don't want to put it out there. Because I think it's so important; the whole point of what we do is sharing and I don't think it pays to be precious about it. Your ideas are your ideas and no one can take them away from you. Even if they've got the same material then they have different ideas about it. [Participant 18]

Continuing, it is worth noting that scholars in this study, who shared information with colleagues, chose to do it either through private communication avenues (e.g. email) or public ones, like blogs, websites (personal or project-based) and, sometimes, social media. Furthermore, in some cases, scholars were keener to exchange specific types of material from their collections; for instance, Participant 15 preferred to share information related to teaching practice rather than research.

> Well, I would exchange information in the form of teaching. I'm putting courses up in the Web, I would contact other colleagues, they would send me images of paintings and I would do the same. I would send then information, pdfs and things like that. So, it's this marketplace if you like, this kind of intellectual commerce going on. [Participant 15]

Besides the information on scholars' sharing preferences, though, this quote implies that there were unspoken rules underpinning the overall sharing process. Participant 15's metaphor 'intellectual commerce'- remembering Participant 10's earlier comment on the use of their personal collection as a diplomatic tool- clearly showcases the expectations behind this practice

which were that if you gave something you expected to get something back in return, an issue that was apparent in many art historians remarks about sharing.

Regarding sharing information with institutions, like libraries and museums, research participants were generally more guarded towards giving material from their collections, mainly because they were not sure how such a process could work. Nevertheless, there were art historians in this study whose collections would be part of a museum database after the end of their project (e.g. Participant 12), or who were positive towards the idea of supporting an institutional collection (e.g. Participant 13), especially if there are certain benefits to be gained and their contribution is acknowledged (e.g. Participants 04 and 16).[135] Participant 13, who was also planning to make available resources from their PhD online after completion, expressed their enthusiasm when asked about the possibility of giving material to an institution.

> Oh, I would love that! I think that would be fantastic. I think that there's not enough sharing actually of material when it comes to things like that. And especially to libraries, I would be more than happy to give them, for example, articles that I found that I know that they don't have in their archives or images as well that I got from old newspapers and magazines. I would be more than happy actually to do that. [Participant 13]

Indeed, given that art historians' personal collections are usually extensive and contain a great variety of material from their research trips around the world, they could be of interest to many institutions which lack material in specific disciplinary areas (as Participant 13 also argued). Having earlier (pp. 210-213) discussed potential collaborations between scholars and institutions, it may be worth restating that potential benefits such as access to institutional resources or support with regards to information management (e.g. updating scholars on the most appropriate tools to use) and issues like copyright could be a good way of persuading scholars' to contribute parts of their personal collections or their expertise in specific areas of study.

Finally, during this part of the discussion, it was interesting to notice that scholars in particular disciplinary areas, like Participant 03 and Participant 08 below, talked about the sharing attitudes and related practices conducted in those areas as being distinct from those in other areas of art history.

[135] Beaudoin and Brady (2011, p. 32) also found that some of their participants were keen to contribute to institutional databases.

> I'm always very happy to share stuff and that's great. […] The art historical people, I've been warned by them saying that 'You shouldn't share stuff', 'They're going to take your stuff'. […] But it is really nice when you feel that you've actually been able to help somebody by giving them some material, in order to help things up. I actually like that. And certainly the Patristics, the Divinity people, the people who are fond of these sort of slightly antiquated areas, they all maintain this very nice, sort of rather Victorian thing that you share stuff and that's great. [Participant 03]

> Since Japanese Art History and Japanese History are relatively small and specialised fields of research we do have some very efficient information-sharing online platforms and lists, such as the Japan Art History Forum. It is common for researchers going into a new topic, for example, to ask the platform about known collections and examples of particular visual materials, and the information is shared publicly. Sometimes people also ask for contact details of a particular curator to access collections or about copyright issues, so there are increasing efforts to share information. [Participant 08]

Thus, according to these art historians' accounts, there can be certain sub-cultures inside the general discipline of art history which, as in this case, have different behaviour towards sharing; Participant 03's comment regarding the contrast between the sharing attitudes of scholars in their area of study and those in others clearly illustrates this argument. Similarly, in areas like Participant 08's, which can be considered small and specialised compared to others, there is mutual support through the sharing of information; as was mentioned previously in this thesis (e.g. see pp. 103-104), scholars in areas like this (non-European art) were more likely to face problems in finding and accessing information, a challenge which, as this example also shows, was often tackled through colleagues' support (see p. 127).

As a result, this finding may suggest that different areas inside the art historical discipline can have different behaviour where certain practices, like sharing, are concerned which, then, generates questions as to the different needs scholars in these areas might have. Yet, although our goal in this study included the discovery of any possible links between art historians' personal collections and scholarly practices, like sharing, it was beyond the initial purpose of this research to explore these issues in more detail. Nevertheless, given the association that may exist between different sub-cultures inside the discipline and the information behaviour of scholars, including the tools and services they employ, further research examining such differences and the factors that trigger them could potentially lead to interesting results.

In addition, though, to providing an insight into the sharing behaviour of various groups in the art historical discipline, the quotes just presented are good examples of the various issues that could arise during the interviews around the topic of personal collections. More specifically, the conversation about the practices related to the information gathering and organisational behaviour of art historians was often the basis for stressing and debating matters that concerned either aspects of the practice of scholars in general, such as any problems and wishes they had, or their views on the state of the field, especially in relation to technological advancements; by constituting the point of departure for discussing various aspects of disciplinary practice, personal collections' major role in the work of art historians as scholars was once more demonstrated. Given the limited scope of this study, though, it will not be possible to discuss here these issues; however, this aspect of the findings is intended for publication after the completion of this thesis.

To conclude, in this section, we attempted to explore the value of personal collections by drawing on issues that showcased that they were at the core of art historical practice. Thus, it was demonstrated how personal collections were linked to other scholarly practices, like writing. As part of this endeavour, their various uses were also discussed, while we specifically focused on the sharing behaviour of the participants of this study. This part of the thesis completes the presentation of this study's findings; the conclusion which follows will summarise the main points made in this chapter.

8.3 Findings Summary

In this chapter we sought to understand the different ways through which scholars in this study organised, used and managed information in their digital and physical personal research collections. As in previous literature, art historians were found to utilise a variety of methods and apply personalised criteria when organising information. However, in this thesis, it became apparent that scholars dealing with non-traditional information objects (e.g. mailing lists, online artworks or non-Western art objects, like Japanese scrolls) faced challenges during information organisation and management in the digital environment not encountered by others (e.g. due to the format of the information objects).

Thinking about digital tools and software that will meet this group of scholars' needs, our findings showed that they prefer user friendly tools and applications that are easy to learn,

with simple interfaces and basic features that facilitate the need for interaction with information in visual ways. Also, relevant tools should allow for personal criteria to be applied and be compatible with their devices and, potentially, with other programmes. Finally, they should not be costly or entail complex technical processes for their operation. In the cases where support through training is needed, it was argued that this should be tailored to the art historians' needs while the time a tool is provided or introduced (e.g. at the beginning of research) can also matter to scholars. Apart from the preferred characteristics for tools and services, though, we had the opportunity to present and discuss their wishes considering any desired technologies that would enhance their work (e.g. cross-referencing).

Concerning the organisation and management of information in the physical space, the potential of the physical material to support flexible ways of working with information as well as memory was once again highlighted. Lastly, the different ways in which scholars used their personal collections in order to support their research and teaching projects demonstrated the important role they played in their daily work and career more generally. It is worth noting the strong connection existing between the development of a research project and the structure of a personal collection; re-organising information at a later stage of research enabled some of the participants to think and build their research argument. Yet, given that scholars increasingly collect and create a diverse body of material in digital format, using the digital and physical parts of their collections effectively will become even more challenging; supporting researchers with tools tailored to their needs is essential if it is to successfully facilitate their research workflow.

CHAPTER 9: DISCUSSION

The aim of this chapter is to bring together the key points stressed during the presentation of the research findings and draw conclusions by referring back to the research goals of this study. Hence, the first sections will look at art historians' initial steps prior to the building of their personal collections and, more specifically, on their use of digital resources, from the criteria influencing their decisions when choosing them to any user requirements when interacting with them. Then, the emphasis will shift to scholars' collections and the activities conducted as part of their creation, use and management. In particular, the related sections will focus on the main findings surrounding the gathering behaviour of the interviewees and any matters showcasing the impact of certain tasks conducted at the beginning of the building of their personal collections, such as the labelling of information, on the use of the collected material and the research process in general. Additionally, the major observations about the role of personal collections and the significance of practices like information management in art historical practice will be summarised and the specific scholarly needs highlighted. The essential resources from the literature supporting these arguments will be restated where necessary.

9.1 Beginning Research

9.1.1 Emerging Information Objects

To begin with, it should be mentioned that this research confirms previous studies' findings (e.g. Bakewell, Beeman and Reese 1988; Reed 1992; Rose 2002) with regards to the variety of information objects that art historians use in the contexts of their projects as well as the breadth of topics studied in the discipline and the methods employed. However, it was also found that art historians have to deal with an even broader range of information objects (especially digital), such as mailing lists, computer graphics or social media and social network data.

Since the purpose of the study was to assemble a group of research participants which included not only scholars conducting research in traditionally studied areas (in terms of topic

and methods), but also in areas which have been understudied and considered non-traditional (e.g. digital art, non-Western art), it was anticipated that additional issues, rarely noted in earlier studies, could be uncovered. It is worthwhile highlighting that prior to this research, there have been few studies after 2000 (as can also be seen in the literature review) examining how the information behaviour of scholars have been shaped by the constant development of digital technologies and techniques. Therefore, given the progress observed in other areas of the Arts and Humanities (e.g. Digital Humanities) concerning the use of digital technologies and the rise of new information objects (e.g. see Bulger et al. 2011), it was not surprising that several scholars in our cohort of art historians (from both the traditional and non-traditional research category) had started engaging with more types and formats of information than had been employed before.

Yet, as the summary of the major points of the thesis' results in this chapter will also highlight, the employment of these information objects usually raised several issues with regards to their discovery, gathering and organisation, affecting the information behaviour of the art historians using them. Identifying the types and formats of data that art historians utilise was one of the primary considerations of this thesis; the related findings would enrich our knowledge as to the material which makes up personal research collections as well as to the challenges associated with particular types and formats.

9.1.2 Art Historians and the Use of Digital Resources

A major part of the analysis was devoted to the examination of the places that researchers in this study visited to find information for research and teaching purposes. Drawing on the research goals of this study, getting to know the criteria upon which scholars decide which resources to use at the start of a project and beyond was an essential step towards understanding the practices used to access the information they needed and which, eventually, lead to its gathering and the creation of a personal collection.

Hence, the analysis of the relevant interview excerpts raised several issues regarding this aspect of the research process which are worth restating. Firstly, it is necessary to note that previous studies' findings on the limited access to useful resources, such as good quality visual information, that their participants were experiencing (e.g. Durran 1997; Rose 2002; Greenhalgh 2004) were again validated in this research. Finding high quality images, in par-

ticular, is of paramount importance for art historical research. Although participants in this study did not raise the issue of colour accuracy, it can be argued that, for the majority, this was one of the main concerns when looking for and using digital resources containing visual material. More specifically, high resolution and colour accuracy are necessary features of the digital images used in the study of art and historical artefacts (e.g. see Terras 2010); according to Rhyne (1997) 'as evidence, images are valued to the extent that they approximate what one would see if looking at the object itself.' Digital images with these characteristics are essential tools for conducting traditional (e.g. see McKim 2016, p. 4; Graham and Bailey 2006, p. 24; Bakewell, Beeman and Reese 1988, pp. 13-14, 19-20) and digital research (e.g. see Drucker 2013, p. 8) as well as for teaching and publishing in art history (e.g. see Shaw and Wagelie 2016; Kohl 2012).

Various other studies have argued over the significance of high resolution and colour accurate digital images in the study of culture. When researching cultural heritage objects, high quality digital images 'can yield insights into documents and artefacts which were hitherto unavailable' (Terras 2008, p. 135) and, thus, facilitate new discoveries. Apart from enabling scholarly research, such images are also an important tool in conservation of cultural heritage artefacts. Martinez et al. (2002) presented the results of ten years of work in the context of the Vasari project which had a goal to produce high resolution and colour accurate images for monitoring the condition of artworks, such as paintings, in the museum sector. Moreover, Boochs et al. (2014, p. 13) argued that 'accurate colour reproduction is one of the most important requirements for imaging techniques for the documentation and study of artworks.' Finally, the opportunities and challenges regarding the development and processing of high quality digital images for preservation and restoration purposes as well as the study and communication of cultural heritage are illustrated by Korytkowski and Olejnik-Krugly (2017), Imai et al. (2013), Stanco, Battiato and Gallo (2011), Mudge et al. (2008), Barni, Pelagotti and Piva (2005) and Berns (2005; 2001).

Yet, despite the progress that digitisation projects have made over the years and the increase in the availability of online material (especially secondary literature), it became evident through the interviews that scholars lack digital access, particularly, to primary resources and good quality, open access visual material. More specifically, interviewees in some areas of study, such as Asian and Japanese art, faced greater difficulty in finding these types of material online; unsurprisingly, the availability of digital resources on the Web tended to be greater in areas dealing with Western art of particular popular eras (e.g. Renaissance art, 18th

and 19th century art). This finding, then, contributes towards meeting one of the objectives of the study which was to examine whether researchers conducting non-traditional research have different needs from those researching in more traditional projects. It should be highlighted that the call to conduct such an examination was first mentioned in Rose (2002, p. 41) and has not been explored by other studies looking at the information practices of art historians since then.

Also, it should be noted that research focusing on modern and contemporary art would be significantly enhanced by resources which could bring material useful to researchers (e.g. material already available on the Web) together in one place; given that these areas are constantly being shaped by new research, scholars need to be continually updated with regards to new material in their areas of interest. Moreover, since research on the areas described earlier (Non-western art, modern and contemporary art) has been found to be on the rise (see, for example, Long and Schonfeld 2014, p.17), issues of accessibility to resources that meet these art historians' needs become more pressing.

Thus, many of the participants in this study still had to travel in order to visit the archives and museums holding the material they were interested in while, even then, some found it challenging to locate or access it physically. The challenges caused by problematic access were, in fact, one of the principal reasons for building personal collections for current and future projects (also see Beaudoin and Brady 2011, pp. 29-30). Also, in general, the more difficult it had been for a scholar to get access to information (especially to primary material), the less keen they were to share it with colleagues or institutions; yet, it should be restated that the sharing attitude prevailing in certain sub-disciplinary areas could have an impact on their decisions concerning this issue.

Therefore, given the issues stressed so far, it was inevitable that easy access to material (including costs of copyright) would be one of the primary criteria for the research participants when choosing resources to access online and use. The institutions where most of them were based or other easily accessible and frequently visited places (e.g. libraries, museums, archives) were some of the key access providers to material relevant to scholars' projects which had also earned their trust. Previous experience with a resource (or similar resources) and the researcher's intuition were also influential factors when deciding which resources to visit virtually or physically.

Thinking about other criteria for choosing resources to use (presented and discussed in the relevant section), it is worth further highlighting the issue of language which constituted a consideration for scholars who dealt with material in a foreign language and, often, necessary for those researching on highly interdisciplinary topics. Actually, whenever the gathering of this type of material was regarded as essential for the purposes of a project, the challenges posed could affect other information and scholarly practices; for example, the information seeking process could be postponed until the attainment of the required language skills or the difficulties faced when reading the material could impact on the judgement of its quality and, hence, its use in the research project. As Palmer and Neumann argued (2002, p. 107), translation as a practice can affect processes such as those described above, underlining the fact that scholars researching on interdisciplinary topics can have additional information needs. Given that art history is a highly interdisciplinary field in terms of topics studied and methods employed, it became clear in this study that barriers posed by language could influence the research process, an issue which should be taken into account when building digital resources targeted to art historians.

Furthermore, two more findings derived from the analysis of the interview data regarding the places where art historians looked for information are worth restating here: the role that colleagues played in learning about new resources as well as the emergence of social media and social networks as data collection tools in the discipline. Regarding the former, the importance of colleagues in the information seeking behaviour of scholars has been highlighted by many studies (Challener 1999; Rose 2002; Grindley 2006; Kamposiori and Benardou 2011; Long and Schonfeld 2014). More specifically, many of the art historians in this study turned to colleagues for advice on where to start looking for information or which resources to trust. As for the various resources which remain underused by scholars in the field (e.g. several European online initiatives) or those currently being created and targeted at art history (e.g. the new Art History Channel by Europeana),[136] taking under consideration the key avenues through which art historians learn about useful resources (e.g. colleagues) is essential for increasing their use and impact on scholarship.

On the other hand, the use of social media and social networks as resources for finding information related to a research project was a discovery not encountered in previous studies looking at the information practices of scholars in the field. Although art historians were gen-

[136] For example, see the post by Racine (2015) on the Europeana Pro Blog which refers to this initiative.

erally hesitant towards the use of these types of resources, they were keener to employ them when there was a general lack of resources in their area of study or when they constituted the only way to find out about specific information. However, despite the frequent study of the use of these services- especially for scholarly communication purposes- in other areas of the Arts and Humanities (e.g. see Ross et al. 2011; Quan-Haase, Martin and McCay-Peet 2015), there has not been any research examining the different uses and the impact of these types of digital media and services on art historical scholarship.

Finally, it is worth closing this section by arguing that art historians have increasingly become aware of the effects that the design of a user interface, including the searching facilities, of a digital resource or the digitisation process preceding its building can have on their work (also see Kamposiori, Warwick and Mahony 2018); for instance, some of the participants referred to the apparent interpretative choices that had been made to the content of specific resources or referred to the searching problems encountered due to the way that the material was classified and catalogued. In fact, as became evident through the interviews, such editorial choices could reduce the usefulness of the digitised content for scholars, who would then look for another resource online or, if possible, visit the resource physically.

Therefore, concerning the requirements for interface design for digital resources based on the needs of the art historians in this thesis, it was suggested (see p. 116) that a simple interface will enable users with different levels of technical skill to interact effectively with information. Moreover, it should facilitate different types of searching and, especially, visual exploration and engagement with content. Including digital object metadata and information around the digitisation process will also prove useful to scholars when looking for and using digital resources. Incorporating scholars' (as the potential users) views early on in the digitisation process (e.g. through understanding their needs) and providing essential information about some of the core choices that have been made during the building of a digital resource as well as gaining user feedback about aspects of the interface design, will not only increase its usefulness for scholars and earn their trust but can also prove beneficial for the longevity of this resource. Lastly, the ability to view and download material through various means increasingly becomes a necessity for scholars who access and manage information across different devices and tools.

9.1.3 The Quest for Information in Art History

Although this study was not designed to explore in detail the information seeking behaviour of the art historians taking part, it was considered necessary to collect any information that could be of interest for understanding the practices that follow, such as the gathering of information. Hence, a few issues revealed during the analysis of the findings need to be brought again into focus.

Generally speaking, art historians' information seeking practices, to the extent it was possible to examine, resembled the behaviour identified in other Arts and Humanities disciplines and confirmed the results of previous studies focusing on this aspect of scholarly behaviour in art history (e.g. Palmer, Teffeau and Pirmann 2009; Beaudoin 2005; Brockman et al. 2001; Rose 2002; Challener 1999). Thus, chaining and browsing were some of the core practices conducted as part of scholars' quest for information while, as mentioned before, colleagues played a crucial role for discovering new resources, gaining access to essential material and influencing the participants' decisions as to which places to visit (digital or physical) for gathering information.

Although in previous studies information seeking is often presented as a set of practices which are conducted mainly at the beginning of a research project, the results of this study revealed that, in some cases (e.g. when a project was long in duration), scholars needed to go back, at least once more, to the information seeking stage. However, during these later information seeking phases, the behaviour of the participants differed from that at the beginning of the project; it was more likely that scholars would look for specific information (e.g. through direct searching) with more focus at this stage rather than conduct an exploratory search (as in Marchionini 2006). This return to an earlier stage of the research process, though, could prove challenging for some scholars. Given the large availability of online resources in some areas of study, some art historians found it difficult to go back to the decision making process with regards to the choice of information that this stage entailed; dealing again with a large amount of information could lead to more reading or to the constant gathering of material which could then delay the progress of the project.

Actually, the issue of information overload was mostly stressed by the art historians researching areas where the information availability was greater. Nevertheless, this matter was often related to the difficulty in keeping up to date with the constant increase in digital information. Therefore, facilitating scholars with tools and services (e.g. resources which gather

the available material on the Web in one place) that enable them to stay updated with regards to any developments in their area of study (as some of them also wished) could significantly increase scholars' confidence and foster the research process.

Furthermore, it is worthwhile restating that art historians in this study relied heavily on the Google search engine to bring up material of interest, especially when they wanted to 'check what was out there'. Despite acknowledging that this method entailed the risk of missing out important information that does not appear in the search results, for instance, because of not having the right metadata (Google Search relies on natural language rather than the categorisation of data), starting looking for information online and through the Google search engine was a common strategy; Kemman, Kleppe and Scagliola (2014) also found that scholars in the Arts and Humanities extensively used the Google search engine when looking for information.

Thinking about the results of early studies on online searching in the Arts and Humanities (e.g. Bates, Wilde and Siegfried 1995), this type of search was mostly supplementary to scholars' primary methods for finding information, which included practices related to printed information. In our research, though, online searching was a standard practice and a source of inspiration for scholars; this finding is in accordance with the results presented by more recent studies, such as Kemman, Kleppe and Scagliola's (2014) above and Antonijević and Stern Cahoy's (2014), which highlight the integral part that searching online plays in the process of Arts and Humanities research. In order to eliminate the drawbacks of this information seeking method (as discussed above) scholars combined it with others, like colleagues' advice. Moreover, some of the scholars referred to the serendipity factor that could result from online searching. Since there were art historians in this study who mentioned getting inspiration from information (e.g. visual surrogates) for current and future projects, an interesting serendipitous discovery was regarded as an advantage of searching through the Web.

Thus, although previous studies have found that the possibility of serendipity was considered greater for scholars when browsing printed material (e.g. see Foster and Ford 2003, Quan-Haase and Martin 2011), some of the scholars in this study were positive about the opportunities that online searching offers for such a discovery (see pp. 118-120). At this point, it is worth highlighting the connection between creativity (e.g. the inspiration from information mentioned above) and serendipity; actually, various studies have recognised the contribution of serendipitous encounters to the development of creative insights (Boden 1996; Foster and

Ford 2003; McCay-Peet and Toms 2011; Taramigkou et al. 2013). Given that art history has been regarded, in this thesis, as a creative discipline when it comes to interaction with information (see also, Shneiderman 2000; Makri and Warwick 2010), this issue should be taken into account when designing tools and services for supporting information seeking in the field.

Yet, given that exploring in detail this specific aspect of the information seeking and searching behaviour of art historians did not fall within the scope of this study, it was not possible to develop a thorough understanding of any strategies employed for achieving serendipity or the factors influencing it when looking for information online. However, based on this thesis's results, it can be argued that the issue of serendipity was more likely to occur during the first stage of information seeking when scholars attempted to investigate a topic.[137] On the other hand, as observed earlier (pp. 143-144), encountering interesting information was more difficult during the later phase(s) of this activity when scholars were looking for more specific and focused information. Also, the fact that some areas of research were found to benefit from a larger pool of online resources cannot be overlooked when considering the possibilities of discovering information serendipitously. As there is not any study looking at the role of serendipity in art historical research, examining this aspect of scholarly practice can lead to fruitful results; as Makri argued (2014, p. 2185), understanding the strategies employed by scholars (e.g. in creative disciplines) in order to influence the chance of serendipity in digital environments could offer new insights into this, otherwise, difficult to study aspect of information seeking behaviour.

9.2 Building Personal Research Collections

9.2.1 The Gathering of Information

Palmer, Teffeau and Pirmann (2009, p. 16) highlighted our limited knowledge around the information practices involved in the building of personal collections, such as the gathering and organising, along with any patterns in scholarly behaviour. Gathering particularly can be challenging to study; the reasons why scholars decide to gather particular information the

[137] According to Marchionini (2006) this type of search is called *exploratory*.

moment they discover it as well as in what fashion they collect it are details that are difficult to capture. However, the analysis of the interviews brought up several issues regarding this initial step towards the creation of personal collections.

Generally speaking, art historians in this study collected any material they considered of importance for the purposes of their projects at that time or in the future; this finding is in accordance with earlier studies about scholars' gathering habits (e.g. Palmer, Teffeau and Pirmann 2009, pp. 16-17). Moreover, besides the finding concerning the emerging information objects discussed previously, the diversity of the material art historians gathered and the variety of resources consulted were two issues characterising scholarship in the field which have been raised frequently in the related literature (e.g. Beaudoin 2005; Durran 1997; Beeman 1995; Reed 1992; Stam 1984).

However, given that the focus of this study rests in understanding key aspects of the practices of art historians after the discovery of information, its design and the employment of relevant information behaviour models enabled the identification of a pattern in their gathering behaviour not previously recorded. More specifically, by using Kuhlthau's *Information Search Model (ISP)* (1991, pp. 366-368), and especially its *collection* stage, as a tool for examining the interview data with regards to this part of the building of personal collections, it was found that art historians' gathering behaviour consisted of, at least, two main phases. Although in Kuhlthau's model the gathering of information takes place only when the user has developed a certain confidence in their topic and, thus, it is naturally more focused, art historians in this study began gathering material much earlier, at the time resembling Kuhlthau's *exploration* stage.

Indeed, apart from being conducted in the context of exploring a new topic at the beginning of research, this first phase of gathering was often a result of the feelings associated with the obstacles (e.g. frustration due to limited access) encountered during the information seeking process (corresponding to Kuhlthau's exploration stage), making the need to gather as much as possible (digitally and physically) more intense. Then, following our earlier argument about the two major phases (at least) of information seeking that can be encountered in the course of an art historical project (e.g. based on its length), a second gathering phase was identified. As the second information seeking phase, it was more focused and bore similarities to Kuhlthau's collection stage, even though it was found to occur at a more progressed research stage (after reading and during writing). Yet, as Kuhlthau argued, it is possible for

users to gather information during various stages of the research process based on their particular behaviour and needs, while entering the writing stage as well as conducting an initial organisation of the collected material may enable them to develop this more focused approach which leads to the second phase of gathering (Kuhlthau 1991, pp. 368-369).

Therefore, after the discussion on the characteristics of these two distinct phases (see also Table 3, p. 147) which were derived from the examination of the information behaviour of art historians in this study, a variation of Kuhlthau's ISP model was suggested. This should include an additional gathering task at the exploration stage called *Exploratory Gathering* which will follow the *Exploratory Information Seeking* conducted beforehand. Moreover, the second gathering task (with the same characteristics as the one described in the model) can be named *Focused Gathering* and will come after the *Focused Information Seeking*. This finding was also examined from the perspective of other information seeking studies which include aspects of information collection in their models (e.g. information gathering, information managing), such as Shneiderman's framework (2000) or Meho and Tibbo's (2003) extended version of Ellis's model.

In particular, according to Shneiderman (2000, pp. 119-124), the non-linearity in the information practices of users is a characteristic of the creative disciplines; accordingly, users can have different information needs during the different phases of certain tasks. Having argued that art history is a creative discipline and identified a non-linear aspect in scholars' information seeking and gathering behaviour, it is suggested here that art historians have different information needs during the different phases of these practices; this finding, which adds to the existing knowledge about the information seeking and gathering practices of art historians, should be taken into account when designing digital resources and tools targeted to this group of users. For example, by further understanding the reasons behind the different behaviour that scholars have at the different stages of research (e.g. problematic access or the need for more 'focused' information and, accordingly, the types of material needed), it can lead to a more targeted approach towards the digitisation of material that is currently unavailable as well as to the creation of digital resources which have enhanced searching facilities and useful metadata that facilitate the discovery of this information.

Yet, this issue not only affected the initial stages of the building of personal collections, but also complicated the processes associated with information organisation and management. Taking into consideration that personal criteria were also influencing how scholars gathered

information (e.g. collecting the pdfs along with the reference or adding the related metadata in an image file) or the fact that the gathering of new information could be conducted very frequently in the course of a project (besides the more intense periods noted above), managing personal collections as they grew was a challenging task.

In fact, the problems caused by the constant growth of scholars' personal collections affected the way the gathered information was used (or not) and, consequently, the research process. Therefore, the analysis of scholars' views on the difficulties faced due to the continuous development of their digital and physical collections revealed the connections existing between the practices conducted during their creation (gathering) and the practices that follow (organisation, use and management); this issue highlighted the importance of information management for the effective use of the gathered material, justifying Meho and Tibbo's inclusion of information managing as an additional feature in Ellis's information seeking model.

9.2.2 The Importance of Information Organisation and Management

Although this study adopted the definition of the activity of collecting with two primitives, gathering and organising (as in Palmer, Teffeau and Pirmann 2009, pp. 16-19; also see p. 27 in this thesis), it went beyond it, to explore aspects of information management. Having argued that personal collections are at the core of art historical research, it was important to get a complete picture of the ways scholars handle information 'behind the scenes', including their habits and attitudes as well as the different uses of their collections.

Hence, our results showed that art historians tended to record, store, file, label, and organise the material they had gathered in a variety of personalised ways both in the digital and physical environment. Although the details concerning this finding confirmed earlier studies' arguments on the diversity of means and methods employed for conducting such activities (e.g. Beaudoin and Brady 2011; Rose 2002; Bakewell, Beeman and Reese 1988), they also unravelled aspects of scholarly behaviour not examined before in detail.

To begin with, it is worth stressing that, as in earlier studies (e.g. Rose 2002, pp. 37-38), many art historians still utilised traditional means (such as boxes, index cards, paper folders) as part of the management of their physical collections. Nevertheless, it should be restated

that all of them maintained both digital and physical collections and, even though using traditional means was certainly the case for those maintaining large physical collections, there were several scholars who increasingly tended to store material in digital format (especially images) by using various types of software, computer programmes and other applications.

However, employing digital means for storing information did not necessarily mean that scholars preferred to work with digital formats. Actually, print formats allowed art historians to engage with the material in ways that the digital environment did not; even some of the participants who were comfortable with digital technologies, like those employing digital methods in their projects, mentioned using print media for conducting core scholarly practices, from annotation to visual data comparison. Previous studies looking at the use of digital and print resources by researchers have also found similar issues occurring (e.g. Kachaluba, Brady and Critten 2014; Rimmer et al. 2008), since print formats and, generally, physical environments allow for increased interaction with the material, such as during reading.

Therefore, although Rose (2002)[138] found that art historians tended to employ traditional methods for managing their personal collections due to reasons such as limited time to learn how to effectively organise their material digitally or lack of technical skills, in the current study, it became apparent that the main reasons for scholars utilising traditional formats were longstanding habits (mainly related to academic training) or the better handling experience they offered (browsing, intuitive interaction, ease of use). More specifically, most computer programmes scholars used or, more generally, computer screens were usually considered to prevent the kind of interaction with information that many needed to conduct when analysing their data (e.g. having many things open and viewing them at once). Similar issues were also raised by Bakewell, Beeman and Reese (1988, p. 49) and Rose (2002, p. 38), suggesting that the needs related to this aspect of scholarly practice had not been satisfied even though technology has progressed greatly since these studies were conducted.

Besides the type and level of engagement that print formats permitted, a link between participants' visual memory and the physical qualities of traditional formats (both information objects and means of organisation) was often an additional reason for its appeal to scholars.

[138] A more recent study referring briefly to art historians' personal collections is that of Long and Schonfeld (2014, pp. 23-25) who, even though they mentioned some of the tools scholars used in their research, did not describe in detail the reasons behind their preference for particular media. Actually, after Rose (2002), there has not been any other study in the field discussing such issues, apart from Beaudoin 2005 who published a literature review and included Rose's findings.

For instance, several interviewees mentioned being able to remember information easier when written, drawn or highlighted by hand and when stored and organised physically based on personal criteria (as historians did in Case 1991b). Acute visual memory has frequently been regarded as a characteristic of art historical scholarship (e.g. Reed 1992, p. 752; Brilliant 1988, pp. 121-122). Concerning information use and management, in particular, the visual stimuli that physical material offered (e.g. colour) was an advantage for easily re-discovering information in the physical environment; on the contrary, if digital information was not filed and labelled properly, it could be challenging to find and use when needed.

Therefore, when employing software or other programmes for the storage, organisation and management of digital information, scholars regularly looked for the flexibility and level of interaction that they were used to when dealing with print material. As a result, art historians in this study preferred using tools which provided the ability to store different types of material, organise and search it based on personal criteria (e.g. through tagging) and which ideally offered integration capabilities with other applications and services, enhancing the opportunities for sharing and re-use. In their quest, though, for a tool that met most of their information management needs, many scholars used software for purposes other than those for which it was originally designed (e.g. bibliographic management software as notetaking tool); even if there were cases where such decisions were largely based on reasons like familiarity, using a programme for a variety of purposes often meant that scholars could keep much of the related material together. Since most of them used the material in their collections for different purposes (research projects, teaching, publications), keeping associated material together enabled them to easily re-locate and use it.

Furthermore, cross-referencing information was one of the most common needs scholars had when looking for an information management tool; connecting especially textual and visual information was considered important for the construction of the research argument. It is worthwhile restating that this wish was firstly noted in Bakewell, Beeman and Reese's (1988, p. 54) study, but it is has not been fulfilled yet. Although needs such as this could be met by database software designed for the purpose of archiving and managing different types of data, scholars consciously decided not to employ it. Apart from two participants whose research goal included the creation of a database, everyone else utilising some kind of tool for information management purposes preferred to adopt more user-friendly solutions. Indeed, the tools mostly preferred were closer to image viewers than database software; the latter was difficult to learn and entailed complex processes (setting up, updating), while it did not permit

scholars to work intuitively with data during its analysis or required advanced technical skills for doing so.

Hence, research participants preferred using digital tools that, even though they could not meet all their needs (e.g. adding metadata or cross-referencing with other types of information), enabled them to work easily with visual information (by grouping and comparing them according to personal criteria), while they had simpler interfaces, were easy to learn, and usually free to acquire. Given that many of the issues discussed above have not been previously raised with regards to art historical research, it is important to take them into consideration when designing tools and services to support scholarship in the field.

However, particular challenges were met by interviewees conducting non-traditional research (e.g. digital art or non-Western art), since the format of the data they were using (e.g. mailing lists or multiple-frame art objects which combined image and text) was not supported by the information management tools that were most commonly used by other art historians (e.g. image viewers, bibliographic managers). Therefore, thinking about Rose's (2002, p. 41) suggestion that scholars researching on non-traditional topics may have different needs, and which fell into the interest of this study to explore, it was confirmed through the analysis of our results that scholars in this category did indeed have needs which were to a significant extent not satisfied by existing digital tools and services, from information seeking to information management. Yet, since this thesis's purpose only partially involved the examination of this group of scholars' behaviour, further research is needed in order to increase our understanding of the issues raised here as well as of other particular needs that these art historians might have during the research process.

Moreover, although Rose (2002, pp. 37-38) found that the organisational habits of art historians had not at that time been affected by the development of digital technologies, in the current study findings showed that scholars actively searched (e.g. by participating in workshops, asking colleagues etc.) for digital tools that would enable them to keep track of the information in their ever-growing personal collections and use it effectively, while giving them a greater feeling of control which could positively influence their work. Thus, apart from using print resources and media for reasons, such as easier access or the familiarity of the experience, all participants recognised the need to better manage, at least parts of their collections, in the digital environment; some scholars even tried to manage both parts of their

collections through digital means as it was getting harder to find information and use it when needed.

Since the constant acquisition of various types and formats of information (especially electronic) in the digital age has made it particularly challenging for art historians to keep track of the material in their collections (as also in Case 1991b, p. 657), there is a rising need to support scholars in the field with appropriate tools and services. However, as Beeman (1995, p. 96) also argued, the organic quality of art historians' collections needs to be taken into consideration when designing tools that would allow scholars to easily conduct any tasks needed as part of their collection development; for example, as scholars' projects and their understanding of their topics progressed, they often found the need to re-structure and curate parts of their collections, facilitating in that way their work in the context of their projects. Given that the issue of managing and curating large amounts of digital data will become more pressing in the immediate future, assisting scholars in managing effectively and keeping track of the information in their collections will enhance re-discovery and re-use of this material in research and teaching.

As was discussed earlier, though, the avenues through which scholars learn about related tools and services (e.g. colleagues and institutions), the stage of research that a tool or related training is provided (if necessary, as explained on pp. 189-190), or, even, the fact that most of those interviewed prefer to work from home should be taken into account if it is for scholars to find out and benefit from such resources. Finally, as mentioned previously (e.g. see p. 187), information professionals may also have a role to play in this process (also in Beaudoin and Brady 2011, p. 32); their expertise and assistance, especially with regards to information management, would be particularly welcomed by scholars who do not have access to institutional support (e.g. independent art historians).

9.2.3 The Potential of Personal Collections

Regarding the importance of personal collections for art historical scholarship, it was showcased through the presentation of this study's results that they had a central role in the work of scholars who considered them of value for their projects at the time or in the future. As many of the participants acknowledged, their collections revealed their interests and much of the material represented their knowledge and specialty in the field.

In addition, since amongst the research questions of this study was to explore the use of personal collections and their relationship with specific research activities, a connection between the scholarly practices of (re-)reading, writing and publishing was identified; writing, in particular, was the stage where most scholars mentioned re-visiting their collections to use the material there. This finding on the use of personal collections confirms previous studies' results on what scholars in a variety of disciplines do with the information they collect (Brockman et al. 2001; Case 1991a; Soper 1976). Case (1991a, pp. 76-77), especially, highlighted the link between the collecting activity and the writing and assembling process, arguing that the gathered material was of importance for constructing the research argument in historical studies.

Furthermore, the potential of these collections for sharing and re-use was an issue that, based on earlier studies (e.g. Beaudoin and Brady 2011; Kamposiori and Benardou 2011; Palmer, Teffeau and Pirmann 2009), was worth examining further. Apart from revealing aspects of the information behaviour of scholars in the field, the study of art historians' personal collecting behaviour also brought to the surface issues related to other aspects of their scholarly practice. Actually, personal collections constituted part of the career concerns that several young scholars expressed during the interviews. More specifically, early career scholars and PhD students were very aware of the importance that their collections had for their future careers, their potential to publish and to find a job, as the academic system dictates. Thus, they were often reluctant to share information from these collections.

However, this was only one aspect of the problem. The other was the difficulty in accessing the resources mentioned earlier and the copyright issues related to the visual material which raised the value of personal collections; thus, several scholars preferred to use parts of their collections as 'diplomatic tools' to be used in exchange for other information. Nevertheless, there were cases of scholars who were positive in sharing material with colleagues or institutions, such as libraries, opening up new possibilities for collaborations in the digital age which should be further investigated and supported accordingly.

9.3 Chapter Conclusion

This chapter aimed to summarise the key points stressed during the presentation of the research findings through referring back to the goal of this study and to earlier pertinent stud-

ies. Thus, the major issues with regards to the initial stages of research prior to the building of personal collections were discussed; these ranged from the use of digital resources and the criteria influencing scholars' decisions when choosing them to any user requirements when interacting with them. Additionally, the most important issues identified during the analysis of the findings on the information seeking activities of art historians in this research were highlighted.

By shifting, then, to scholars' collections and the activities conducted as part of their creation, use and management, we had the opportunity to look again at the results concerning the gathering behaviour of the interviewees, such as the two-phase seeking and gathering they experienced and the different needs they had during these distinct stages. Any matters showcasing the impact of certain tasks conducted at the beginning of the building of personal collections, such as the labelling of information, on the use of the collected material and the research process in general were also further discussed. Finally, the major observations about the role of personal collections and the significance of practices like information management in art historical practice were summarised and the particular needs of scholars when conducting them underlined. Following, by looking back to the research questions and objectives of this study, the final conclusion of this thesis will be presented along with suggestions for further research.

CHAPTER 10: Future Research

The goal of this chapter is to offer suggestions for exploring further some of the key findings that emerged while examining art historians' behaviour with regards to their personal collections. As previously argued, looking at the way scholars' in this study built their collections of information constituted an excellent opportunity for uncovering matters around their scholarly and information practices rarely discussed before. However, besides the findings that directly answered the research questions of this thesis, such as those related to the information gathering patterns and organisation behaviour of scholars in the field, certain issues were revealed that could not be examined in-depth as doing so was deemed out of scope for this research or not possible due to the study's limitations (see p. 65).

In this chapter, the focus will be placed on four areas: social media, art historical libraries, email lists, reading lists and teaching materials. The aim will be to highlight issues that derived from this research around these areas which are worth examining further while looking at how they intersect with personal research collections. More specifically, personal collections will be either part of the topic to be investigated or part of the methodological approach to be employed when examining the issues proposed here. The ultimate purpose of this chapter is to facilitate future work in the area while also confirming and expanding on the findings of this thesis.

10.1 Social Media

Art historians' engagement with social media in this study frequently went beyond their use as communication tools. Yet, even though the results of this thesis showed that social media become increasingly part of the art historical scholarly workflow, there is limited understanding of the different ways in which these tools are employed in the context of research and teaching in this field. In this section, our suggestions will mainly refer to those social media categories 139 and tools that were identified through the findings: social networking (e.g. Facebook); blogging (e.g. Blogger, WordPress); microblogging (e.g. Twitter); collaborative

[139] Rowlands et al. (2011, p. 184), in their study, talked about eight categories of social media that are often used in the context of academic research: social networking; blogging; microblogging; collaborative authoring tools for sharing and editing documents; social tagging and bookmarking; scheduling and meeting tools; conferencing; image or video sharing.

authoring tools for sharing and editing documents (e.g. Google Docs); image or video sharing (e.g. YouTube); social tagging and bookmarking (e.g. Feedly, Instapaper). Yet, regarding the latter category, this thesis's findings showed that related tools were valued primarily for their personal information management potential rather than the social sharing functionalities that some of them offered.

Zorich in 2012 and Rodríguez-Ortega in 2013 noted that art historians had still not taken full advantage of online and interactive technologies, such as social media, in the way that museums or other disciplines, such as linguistics, had done. Zorich (2012) referred mostly to the possible benefits that the employment of social media for scholarly communication purposes could bring to the field of art history while Rodríguez-Ortega (2013) noted how the potential increase in the use of digital and online technologies instigates a need to re-think what art history is in the digital age. Apart from these issues, though, there was not in-depth discussion about the impact of these technologies on the broader research lifecycle. Actually, such a discussion often requires the examination of practices that are conducted 'behind the scenes', at the scholars' personal workspace, throughout the course of a project.

Generally speaking, the employment of social media by academics during different stages of the research lifecycle has been explored by Rowlands et al. (2011); their study focused on the role of social media in the scholarly workflow across various disciplines in the Sciences, Arts and Humanities, and Social Sciences. More specifically the authors identified seven stages of social media use during the research process: identifying research opportunities, finding collaborators, securing support, reviewing the literature, collecting research data, analysing research data, disseminating findings, and finally managing the research process (Rowlands et al. 2011, p. 190). Scientists were found to be the main users of social media for research purposes; however, the authors argued that as communication and information systems in the humanities and social sciences get faster and more efficient, scholars will soon increase the use of such tools in their research (Rowlands et al. 2011, p. 186).

Thinking about the cases of engagement with social media tools in this study (within the categories presented earlier), they constitute good examples of the way these can be utilised as part of a project's lifecycle in art history as well as the needs of the scholars who employ them. Considering the use of tools such as Facebook (e.g. Participant 12) and YouTube (e.g. Participant 13) for the discovery of information, it became apparent that these can con-

stitute useful resources when there is limited availability (digital or physical) in a specific area of study or when the topic under study has been researched little before.

Based on the findings of this thesis with regards to the information access challenges that scholars in some areas of art history faced, such topics will fall in a non-traditional category, such as non-Western art and digital art (as in the cases of Participants 12 and 17). However, scholars studying modern and contemporary art as well as those conducting highly interdisciplinary research may meet similar difficulties (e.g. in the case of Participant 13). Therefore, scholars working on the above areas may turn to social media to find the information they need in the context of their research and teaching projects. Yet, as information found on social media increasingly become part of the primary set of data for areas of research such as contemporary art and digital art,[140] trusting the information accessed through related tools may be an issue of consideration for scholars.

Besides social media as data discovery tools, scholars in this study employed them for reasons such the facilitation of the scholarly argument (Participant 17 used microblogging and collaborative authoring tools and Participant 07 used blogging tools), personal information management (e.g. Participants 17 and 18 used social tagging and bookmarking tools), networking and the dissemination of ideas and outputs with regards to research and teaching (e.g. Participants 06 and 15 employed blogging tools). Social media as a method for developing and sustaining a network of peers as well as sharing information regarding one's practice was particularly important for independent scholars in the field (e.g. Participants 06 and 10 who used blogging and microblogging tools) who, often, found it challenging to communicate their work through the traditional academic routes.

Thus, based on our findings as well as on those of the more recent literature in the broader area of the use of social media in academia which suggests that scholars continue to employ these tools for research and teaching (e.g. see Botting, Dipper and Hilari 2017; Sugimoto et al. 2017; Papalexi et al. 2016; Rowan-Kenyon et al. 2016; Veletsianos 2016), it can be argued that there is a need to further investigate this aspect of art historical research. Before proceeding, it should be noted that Rowlands et al.'s (2011) study will often be used as a reference point when making some of the methodological suggestions in this section as it is one of the few studies that looks at the use of social media throughout the research work-

[140] As previously argued, a relevant example is the project by Frost (2013).

flow. Despite its date, and as most of the recent studies looking at the use of social media by academics imply (as above), the results of this study remain relevant; the fact that it is one of the studies in this area with the largest sample of participants (two thousand researchers) is also a contributing factor.

The suggestions for potential methodological approaches to the examination of the relevant art historical behaviour in this section will hopefully constitute a starting point when pursuing future work on the area. Understanding the context within which these tools are used as well as the reasons behind scholars' decisions to employ particular tools during different stages of the research lifecycle will add significantly to our understanding not only of the variety of resources used today in art historical research, but also of the discipline's development over the last years, in terms of topics studied and methodologies employed.

To begin with, future work may seek to gather information around the types of social media tools scholars employ nowadays and attempt to outline the different circumstances of use. For achieving that, a large scale survey with participants from different areas of the art historical field will provide a good idea of the range of related tools used across the sub-disciplines. In fact, designing a survey similar to the one used by Rowlands et al. (2011) in their study should yield fruitful results. For example, separating social media technologies into different categories (as noted in pp. 229-230), providing examples of such tools and asking respondents to choose the ones they use more frequently or to suggest others, will build an interesting picture of the tools utilised by scholars in the field as well as provide a glimpse of the practices they conduct through them.

Yet, in order to be able to identify any trends regarding the use of specific tools in the various sub-disciplinary areas of art history, some contextual information about respondents' professional background and career level should be collected at the beginning of the survey. This type of information can be also pertinent for uncovering any tendencies concerning social media use based on career level. Although, the results of this thesis did not bring up any strong tendencies with regards to the employment of tools, such as social media, based on career level or age, a large scale quantitative study focusing solely on this subject will certainly provide further insights on the issues raised here and expand our knowledge around the topic.

It may be worth mentioning Rowlands et al.'s (2011, p. 188) reference on the difficulty they faced when attempting to identify a general pattern in their data by using age as an analysis factor; they realised that the main difference between age groups (especially those under or over 35) was of a more qualitative nature as the younger ones felt that social media tools were part of their cultural identity. They also noted that social media use will, to some extent, concern most age groups in the future (2011, p. 190) which makes such studies even more complex. The results of such a survey would prove particularly useful for information professionals and university or library staff responsible for designing training courses or modules in art history.

However, gaining a more detailed picture of the practices associated with certain social media tools as well as the research stages during which these are employed will require the inclusion of relevant questions, with choices, for scholars to answer. A suggested list of categories, according to the findings of this thesis and the categories presented by Rowlands et al.'s (2011, p. 190), that will help identify the different uses of such technologies and the different stages of research during which these occur, can include data collection, research development, analysing research data, managing the research process, identifying research opportunities, disseminating research data, networking, and teaching.

It should be noted that issues such as the use of social media for research development, teaching, and networking, although mentioned by some of the interviewees in this study (e.g. Participants 14 and 15), did not come up in Rowlands et al.'s (2011) project. On the other hand, conducting activities such as reviewing the literature, analysing research data, identifying research opportunities, research collaboration and securing support through these tools, included in their model, were not brought up by the art historians interviewed in this thesis. Yet, as was argued before, a thorough examination of the behaviour of scholars concerning the use of social media was not part of the goal of this study; hence, the use of the suggested list in future work in this area should be expanded or refined accordingly in order to explore the role of these technologies in the scholarly workflow as well as capture any further development in scholarly behaviour around social media use.

Yet, even though quantitative research in the form of a large scale survey is suitable for examining general tendencies and behaviours around the use of social media in the context of art historical research, it is not considered appropriate for learning about the decision making process behind the use of specific tools for conducting certain practices in the scholarly work-

flow. Moreover, it does not allow for understanding in detail issues such as the reasons behind the different needs scholars in the various areas of art history may have with regards to social media or any variations in related scholarly behaviour throughout a project lifecycle.

Therefore, conducting qualitative interviews as complementary methods to the survey will certainly provide a more holistic view of the behaviour of art historians linked to these technologies;[141] this can be achieved by identifying specific areas of interest through the survey results and investigating these further through the interviews. Identifying interviewees who can provide rich accounts of their experience with regards to the issues brought up during the survey and selected for further exploration is of great importance. Asking these interviewees to support their arguments with tangible examples of their use of tools will illustrate further their answers and constitute a method of triangulation, confirming to some extent what is being said. Seeing these examples, and potentially gaining consent to use these in the written account of the study (e.g. as screenshots), is one of the few ways to fully comprehend and showcase how social media are used throughout the scholarly workflow in the field.

Generally speaking, although there may be studies where identifying and studying examples on the Web without interacting with the creators/ authors, as part of observational research, is considered appropriate,[142] a similar approach would not be suitable for understanding in detail scholarly behaviour in art history around these tools. The reason is that it may not always be possible to know whether a person behind a social media account meets your targeted research participant profile or the purpose of the use of social media may not be apparent to the observer (e.g. when scholars look for information related to their projects). Moreover, online observational research is arguably not useful for learning what art historians do with the information they find or how these technologies affects other scholarly practices, such as the writing phase (e.g. Participant 17 used Twitter to work on their research argument).

How do these scholars capture, store and organise social media information? As it became obvious through the results of this study, finding ways to store and organise information efficiently was one of the primary concerns of scholars who utilised digital and internet data

[141] Qualitative interviews have been considered appropriate for examining similar issues around the use of social media by other studies as well; for example, see Gruzd, Staves and Wilk (2012).
[142] It is worth stating, though, that there are often ethical considerations related to this practice. For example, see Moreno et al. 2013.

as part of their research and teaching; it is worth reminding that difficulties faced with regards to the management of this information could affect its use and re-use (e.g. as in the case of Participant 17). The ephemeral nature of information, such as social media data, can be a challenge for scholars who increasingly use it for the purposes of research and teaching. The participants who used social media in this thesis described their use principally for research purposes. However, scholars increasingly utilise these technologies in educational contexts as a tool for encouraging active learning. An example of the use of Twitter for teaching purposes is provided by Jimerson (2015).

Given that there is little research in this area, and as the few relevant cases in this study did not allow for firm conclusions, examining scholars existing organisational practices in relation to this type of data, including how they capture and archive it, will create a more complete picture of art historians' needs. Related behaviour can be studied either as part of the qualitative interviews suggested earlier or in the context of a personal information management study which will aim to identify the reasons for employing particular practices and tools when managing this kind of data as part of the building of personal collections; future research may seek to understand whether current tools and services meet scholars needs or new ones need to be created.

Before closing, it is worth mentioning briefly some of the issues that increasingly concern today's social media users such as trolling, fake accounts and fake news, and highlighting that they should be taken into account by future work examining the use of social media in research and teaching. So far, research studies in the area (such as those presented earlier) have not identified any major shifts in scholarly behaviour in terms of social media use since the time of Rowlands et al.'s (2011) study; Rowan-Kenyon et al. (2016) and Veletsianos (2016), though, referred to raising privacy concerns in academia. Yet, given the constantly changing social media environment and the fact that there have been several reports of trolling and online abuse by academics (e.g. see Campbell 2016; Schneier 2016; Donald 2013), it should be underlined that the issues and approach suggested for future research here may need to be revisited in the long term so as to reflect any changes in attitudes and use towards social media.

To conclude, in this section, we aimed to suggest a methodological approach towards the exploration of the circumstances around the use of social media in the art historical workflow. Future work employing this methodology will not only validate the findings presented

in this study, but will also enhance our understanding around this under-researched area of scholarly behaviour in the field.

10.2 Art Historical Libraries

During the presentation of the findings around the physical or digital places (see chapter 5) where scholars find information regarding their research and teaching projects, it became apparent that libraries were amongst those most trusted and frequently visited. Art libraries, in particular, or other academic libraries containing primary and secondary material relevant to art historians' work were high in scholars' preference; yet, this was not an unexpected finding as previous research has shown that library visits constitute a necessary part of the information discovery journey for most Arts and Humanities scholars (e.g. see Brockman et al. 2001).

This thesis, though, went beyond confirming earlier work on the use of libraries by art historians by taking into account the reasons behind their decision making process when choosing to use specific resources. As a result, it showed that libraries can play an important role throughout the scholarly workflow, from the discovery of information to its management. In this section, we will argue on the importance of enhancing digital art library services to improve the information discovery experience of scholars in the field. More specifically, we will focus on the issue of serendipity and the way it affects or is related to certain scholarly processes identified in this thesis. The aim is to make suggestions on methodological approaches to research this area and discuss how scholars' personal collections may be of interest to those investigating this issue; exploring this further will yield results which will expand on related findings in this thesis, increase our understanding of understudied aspects of scholarly behaviour in the field and provide detailed insights on how to improve relevant services.

As it was shown in this thesis, libraries, such as art libraries which are strongly linked to art historians' professional training and constitute spaces where learning takes place (as argued in p. 194), have the potential to influence scholars' information behaviour. Regarding the physical library space, it offers opportunities to engage with material in various ways (e.g. visual, tactile) (also see Björneborn 2008) - something that is not always possible in the digital environment - which, in turn, support different types of learning and information seeking behaviour (e.g. browsing, chaining, direct searching, scanning). Thus, it can be argued that,

under such circumstances, the chances to discover useful information increase, an issue which is also confirmed by the results of previous studies showing how interactions with physical material facilitate serendipitous discoveries (e.g. see Quan-Haase and Martin 2011; Foster and Ford 2003). In this research (e.g. see p. 140), it was noted that the potential of engaging visually with information is one of the principal benefits of conventional material, especially for art historians, which often leads to serendipitous discoveries.

On the other hand, there were cases in this thesis where scholars were experiencing serendipity in the digital environment; yet, the reported experiences did not necessarily occur in a digital library space. In fact, those who mentioned discovering material serendipitously (e.g. Participants 01 and 03), often referred to digital resources in general and the use of the Google search engine. However, given that examining issues of serendipity in more detail was not amongst our goals, we can not say with certainty which factors (e.g. characteristics of the digital resource, searching techniques) affected scholars' chances of making a successful serendipitous discovery in the digital environment and what the degree of success was compared to looking for information in the physical library environment. It is worth noting at this point that according to Makri et al. (2015, p. 1), making a successful serendipitous discovery means 'encountering information that we perceive to be both useful/potentially useful and unexpected.'

Moreover, in this thesis, we cannot be entirely sure about the reasons why the scholars in these cases referred specifically to the use of non-digital library systems when describing their experiences. Did the digital library discovery systems they tried not lead to any serendipitous discoveries and why? If we take into consideration the findings of previous studies examining this issue in the Arts and Humanities (see above), it is possible that many of the digital art library environments that scholars experienced did not offer the same opportunities for unexpected encounters with useful information as the physical library environment did. Martin and Quan-Haase (2017, pp. 291-292) also found that historians in their study were more likely to experience serendipity when looking for information in the physical library environment and on the Web rather than when using the digital library systems.

In this study, the discussion mostly focused on the way art historians handle physical information in the context of their personal collections rather than in the physical library space. Yet, the results around the usefulness of the physical material (e.g. see pp. 138-139) in conducting several information and scholarly practices were similar to those by other studies,

such as Martin and Quan-Haase's (2017). Since there is little understanding of the issues that affect serendipity when art historians look for information and given that libraries, such art libraries, are some of the key information providers for scholars in the field, it is worthwhile investigating further how digital library discovery systems can be improved to facilitate this aspect of information seeking and, so, provide enhanced information access to researchers.

Thus, based on the findings presented in this thesis, it is suggested that future research may seek to understand the factors that trigger serendipity in the digital and physical environment and explore the relationships between elements of these environments and scholarly behaviour in the field. Race and Makri (2016, pp. 17-22) examined the internal and external factors that facilitate serendipity, some of them often beyond the user's control; these included aspects of the user's personality, such as curiosity, and issues such as topical knowledge, time, communication or systemic characteristics. It should be noted that the authors highlighted the link that exists between creativity, serendipity and innovation, noting that 'most of the same factors that encourage or discourage creativity and innovation encourage or discourage serendipity as well' (Race and Makri 2016, p. 16). Thus, having argued that art history is a creative discipline and shown that researchers often get inspired by information (especially visual material, such as digital images) they find online accidentally, future work looking at the factors affecting serendipity in art history should focus on the relationship between creativity and serendipity and the ways we can employ a more integrated approach towards supporting these phenomena in the digital library environment.

Regarding this relationship and the way creativity can be supported more efficiently by information retrieval systems, Ford (1999) conducted a theoretical analysis of convergent (goal directed) and divergent (exploratory) thinking and argued that although digital systems are already designed to support the former, they should be further enhanced to support the latter, which is often linked to creativity. Additionally, given that the different purposes of divergent and convergent thinking (explore vs. achieve a specific goal) remind of the reasons behind the different types of information seeking and gathering identified in this thesis (exploratory information seeking and gathering vs. focused information gathering as in 'Gathering Information' section of chapter 6), questions are generated as to whether there are certain stages in the art historical research process which can be characterised as more creative and, thus, lay the ground for serendipity to happen. For instance, thinking about our research participants and their practices, they were more likely to experience serendipity at the first stages

of their research when they conducted more exploratory searches and had only a general idea of the information they were looking for (also in Makri et al. 2015).

At this stage, researchers tended to be more 'open' to accidental information discoveries- a personal characteristic identified by Race and Makri (2016, p. 17) as necessary to experience serendipity- and the possibilities to find unexpected information that would significantly affect the research process were greater. On the other hand, during the later stages of research (e.g. writing stage), when creative behaviour was mostly related to the building of the research argument, information seeking behaviour was more goal oriented and the possibilities of experiencing a serendipitous discovery that would have a fundamental effect on the research process were fewer. Exploring further some of these issues will not only validate the findings of this thesis but also foster our understanding of the stages of art historical process where scholars have different information seeking behaviour and, therefore, need additional support by information retrieval systems in 'making their own luck' (Makri et al. 2014, p. 2192) and discovering unexpected, but useful information.

However, in order to achieve this, it is essential to understand in more detail the circumstances of the creative encounters of art historians with information in the digital and physical environment, including the aspects of the information settings that may trigger serendipity and the scholars' behavioural traits and practices related to information discovery, along with their criteria for deeming information useful. Apart from consulting relevant studies in the areas of creativity and information (e.g. Makri and Warwick 2010; Shneiderman 2000) and serendipity (e.g. those referenced in this section), the employment of a qualitative approach towards the study of these issues will be necessary. Most of the studies exploring similar matters in both environments have adopted a qualitative research approach, using methods such as observation, interviews or think-aloud tasks. For instance, Björneborn (2008) employed naturalistic observation of users, qualitative interviews and the think-aloud protocol to identify the dimensions of the physical environment that affect serendipity when users of public libraries look for information while Makri et al.'s (2015) approach to understanding serendipitous information encounters in the digital environment was to observe users while interacting with digital systems and performing naturalistic think-aloud tasks.

Therefore, a two-phase, iterative methodological approach is suggested here involving the observation of art historians' behaviour when interacting with information in the physical and digital environment along with in-depth qualitative interviews. For this purpose, a bal-

anced number of researchers, half of which are at the first stages of their research and half at a more progressed stage should be recruited. Getting some initial information around their research and teaching interests at this stage may also prove helpful especially during the observation session; more detailed contextual information can be gained through interviewing, during the second phase of data collection.

Having such a sample will ensure that adequate information is gathered with regards to the information seeking practices and needs of scholars at different stages of the research process; this will enable the testing of the hypothesis made here around the stages of the research process where creative behaviour is more likely to trigger serendipity, while also extending this study's results on explorative and focused information seeking and gathering. Observing each scholar while they interact within particular information environments (physical and digital) as well as interviewing them in order to gain more detailed insights about their practices will be necessary in order to develop a sound understanding of their requirements and make relevant suggestions on how systems can more effectively support them.

Concerning the physical environment (e.g. in the physical space of an art library), observing scholars while they look for information will facilitate the identification of certain elements of the environment that affect their behaviour and, thus, their chances of encountering information serendipitously. On the other hand, the observation of scholars' practices in the digital environment should involve think-aloud tasks. More specifically, Erdelez (2004) and Makri et al. (2015) suggested asking research participants to conduct self-chosen naturalistic tasks as these are more appropriate when exploring the dimensions of serendipity in the digital environment with the purpose of designing systems that support this phenomenon.

For instance, asking researchers to choose two or more digital art library environments, including ideally a variety of information types, such as visual, text or audiovisual, and search for information in the same way they do in their daily work routine will make the experience as naturalistic as possible. Yet, during these sessions, participants will need to verbally explain what they do (e.g. search on a specific topic or explore), the reasons they do it and comment particularly on any information discovery that may be unexpected but useful. Dur-

ing the observation sessions, the observer[143] should take detailed notes while, in the digital environment, may also want to record users' interactions with digital environments.

Finally, it may be worth observing how scholars interact with different types of information (e.g. textual or visual) in both environments and, if possible, note any tendencies in the behaviour, such as whether their attention is drawn to specific types of information, whether the serendipitous discoveries of certain types of information are considered more valuable than others as well the relationship between these discoveries and other aspects of their research or teaching (e.g. Participant 04 in this thesis mentioned getting inspired to research a topic after the serendipitous discovery of a digital image). Additional questions during the interviewing process will help explore further certain dimensions of the observation data as well as clarify the reasons behind specific practices and preferences.

In fact, getting a detailed view of art historians' motivation criteria and the reasons behind the decisions and strategies that may have led or not to a successful serendipitous discovery can be achieved through in-depth interviewing. The interview guide should be flexible enough to allow for unexpected issues to arise and built based on a first analysis of the observation data with the aim of clarifying some matters that emerged during the first phase of data collection. For example, interview questions can be related to the elements of the art library environment that influence scholars' behaviour and may or may not trigger serendipitous discoveries, the types of the information deemed useful, the stages of research where it is more likely for scholars to experiences serendipity and the reasoning behind this along with the effect that such an experience can have on other scholarly practices.

Ideally, the interviews should take place at the scholars' workspace not only because this is a place where they feel more comfortable discussing issues around their work, but also because such a space often contains resources, such as scholars' personal collections, which can be used to trigger conversation around issues related to scholarly practices. Asking scholars to show relevant examples of information that they found accidentally and included in their personal collections as well as discussing the places they found it and the way it shaped their work can contribute significantly to the understanding of behaviour noted during the observation process through providing a context for the interviewee's practice, interests and

[143] Bryman (2012) and Gorman and Clayton (2004) are useful resources when deciding on the appropriate observation approach to employ in this case.

preferences that are related to their decision making process when looking for resources and encountering information serendipitously. Comparing the collected data with relevant literature as suggested in this section, will not only shed additional light on issues around art historians' serendipitous experiences with information and, thus, further this thesis's findings, but also result in recommendations for resource design that have the potential to improve the digital art library environment and the user experience significantly.

To conclude, this section aimed to suggest a possible approach towards the further examination of the issue of serendipity in relation to art historical libraries, a matter that arose through this thesis's findings. Having argued that there is little understanding of the factors that affect serendipity in art history, such as the elements of the environments, any strategies employed or the research stages where this is more likely to happen, conducting research in this area will advance our knowledge on the topic and validate our results. Lastly, the findings of such a project will be of great value to information professionals who design digital resources, such as digital libraries, and support art historians' information discovery journey.

10.3 Mailing Lists

Based on this thesis's findings, art historians have started engaging with a broader range of information objects (e.g. see p. 94) than has been previously recorded (e.g. see 'Literature Review' chapter), such as born digital data; some of the scholars in this study were found to utilise social media, 3D models and visualisations, internet artworks and mailing lists for the purposes of research and teaching. As there have been few recent studies since 2010 (e.g. see p. 31) looking at how scholarly information behaviour in the field has been shaped by the constant development of digital technologies and techniques, this discovery was to some extent anticipated. On the other hand, having few recent studies in the area means that our understanding of the way these objects are discovered, used and managed in art historical research is limited. Further research on the use of these emerging information objects will not only increase our knowledge of aspects of the information practices of scholars that we knew little about, but also foster our understanding of how the field has developed, including the topics that are being studied and the methodologies that are employed.

This section will propose a way for researching the use of mailing lists by art historians. According to Talja, Savolainen and Maula (2005, notes), mailing lists are also called discus-

sion lists or listservs and they are of textual and asynchronous nature. They are used for the purpose of communicating information to a large group of recipients at the same time and, in some cases, facilitate conversation between professionals. A mailing list can be: moderated - someone is responsible for approving the information to be distributed; in the form of a digest list - a list of information is compiled and regularly sent by the person/people responsible for the list to the subscribers; unmoderated - anyone can post to the list and the information is received by all subscribers.

Through a number of publications in the areas of digital art history, visual studies and cultural heritage that can be of interest to art historians, it becomes evident that mailing lists have mostly been associated with informal scholarly communication. Compared to other types of born digital information (e.g. social media, visualisation data, digital artworks), which are increasingly being used as primary information objects in research and teaching projects in the field, none of the previous studies documenting the information behaviour of art historians has reported findings that demonstrate the use of mailing list material as part of the primary set of data of the scholars participating.

Regarding social media,[144] in some sub-disciplinary areas (e.g. visual studies), they can constitute part of the topic under examination and the information available through these technologies can be used as part of the primary set of data for research or teaching purposes; relevant examples of how social media can be studied from the art historical viewpoint are the studies by Puscasiu (2017), Phillipps, Zerr and Herder (2017), Manovich (2015), Jimerson (2015) and Delacruz et al. (2014), Frost (2013). On the other hand, the use of visualisation data as information objects in art historical research can be seen in papers such as Szabo's (2012), while 3D models are often used as primary information in cultural heritage related studies such as Marques et al. (2017) and Kyriakaki et al. (2014); it worth reminding that Participant 02 in this thesis was also working within this latter area of research. Finally, although there has not been much discussion about how art historians use digital artworks as information objects in the context of research and teaching, an example of an art history project in this area is the paper by Ryan (2014). Also, in this thesis, we had the opportunity to get a glimpse of the information practices associated with the study of internet art through the accounts of Participant 17.

[144] Earlier in this chapter, we mainly looked at how social media are used as part of the scholarly workflow; the examples here focus on social media as part of the primary data set of scholars.

Mailing lists have been in existence since the 1970s (Zhang, Ackerman and Karger 2015) and used extensively by academic and professional communities to facilitate the exchange of knowledge and the sharing of news in areas of interest. Regarding Arts and Humanities scholars, in particular, previous studies have shown that mailing lists and other relevant subscription services have been popular tools for the purposes of informal scholarly communication as well as for monitoring progress in one's field. Brockman et al. (2001, p. 12) mentioned that, although some of the participants in their study did not particularly like using electronic discussion lists as the conversation could frequently go off topic, many of the scholars considered them useful for getting informed about any latest news in their field or learning what other colleagues were studying.

Apart from that, Palmer and Neumann (2002, p. 102) found that mailing lists and relevant subscription services were important tools for interdisciplinary Arts and Humanities scholars since they constituted an efficient way of staying up to date with developments across different fields, something that could, otherwise, be a difficult task. Moreover, Talja, Savolainen and Maula (2005), who looked at field differences in the use of scholarly mailing lists, noted that humanities scholars found mailing lists useful and, thus, were more positive towards their use than users in other fields. An explanation for their usefulness can be found in Matzat (2004, p. 247) who argued that, as humanities (and social sciences) scholars often work in isolation, they find it difficult to stay informed about their field's progress; mailing lists can help them overcome this barrier.

A more recent study by Zhang, Ackerman and Karger (2015) sought to understand the reasons why mailing lists are still being used and how these can be improved. Their findings showed that several academics across different fields preferred them over social media (e.g. Facebook); more specifically, they found that the information shared on mailing lists was considered more relevant to the scholars' professional interests; the discussions felt more private; there was greater confidence that the emails would be seen and read; and, finally, email offered the advantage of personalised management (Zhang, Ackerman and Karger 2015, pp. 4012-4013). Today, most of the studies place their focus on social media rather than mailing lists to explore matters around scholarly communication and information sharing. Yet, it is apparent that researchers still use these technologies as part of their professional work routine. The amount and variety of email discussion lists on JiscMail,[145] which are used by re-

[145] JiscMail, https://www.jiscmail.ac.uk/.

search and education communities across different areas (such as the humanities), demonstrate that the demand for these technologies is still ongoing despite the greater availability of communication avenues.

But how do scholars in the Arts and Humanities and, more specifically in art history, use these tools nowadays? Is it possible that these technologies could be used for scholarly purposes beyond communication and information sharing? What can we learn about individual disciplines through the way researchers use such tools? In fact, these are questions that very few studies have explored. A paper worth mentioning here is Brown's (2001), who explored the way music scholars used email and discussion groups as part of the research process; the results showed how these tools enabled the researchers to meet specific information needs while using them as part of personal and collaborative scholarly workflows (Brown 2001, Table 1).

This paper is a good example showing that useful information about different stages of the research process (e.g. idea generation, writing stage, team organisation) can be gained through the study of the scholarly use of mailing lists. Given that very little research has been conducted on understanding the different uses of these tools by Arts and Humanities scholars, further work on this topic may shed light on understudied aspects of the personal/collaborative workflow of scholars in various research areas. Examining how mailing lists are used by scholars conducting interdisciplinary research (as noted before, this group find these tools especially useful) or working in the context of collaborative and, often, international projects (e.g. in Digital Humanities) where online communication is the norm (e.g. see Siemens 2009) may enable us to better understand aspects of the nature of research under these circumstances; for instance, learning more about their information behaviour (e.g. searching for information across fields) and working practices (e.g. team and task management), and how these differ from those in traditional Arts and Humanities research, can help support them more effectively with appropriate digital infrastructure.

Regarding art history, in particular, previous studies have noted the use of mailing lists by art historians for communication purposes; for example, Zorich (2012) found that art historians favoured email and listservs over social media for informal scholarly communication. Based on this thesis's findings, one of our participants (Participant 17) was found to use information from email discussions as part of their research project. More specifically, part of the data collection process for this art historian entailed gathering material about internet art

through mailing lists; as it becomes apparent through the relevant quote (p. 107), the information exchanged via mailing lists often constitutes a form of documentation that surrounds internet art.

Yet, some of the challenges that this scholar encountered with regards to this type of material were related to its trustworthiness and its unstructured and ephemeral nature. The former issue was often resolved through contacting relevant people, possibly, through similar communication avenues. On the other hand, the latter challenges, which were linked to problems in (re-)accessing, using and managing of this information, were harder to tackle; for example, due to frequent problems in re-discovering the material after it had been collected (e.g. as it could have been removed), this scholar felt the need to gather as much material as possible the first time they discovered it which could then lead to difficulties in management and use (e.g. see p. 151). The lack of appropriate tools to manage this type of material was another complicating factor.

Considering our limited knowledge about the use of this type of digital born information in art history as well as the related challenges, it is not surprising that there is a lack of appropriate infrastructure to support scholars in its use and management. However, unfamiliarity with how art historians utilise resources such as mailing lists for purposes that have not been previously recorded (either as sources of information or tools to support other scholarly practices) also suggests that we, still, do not fully comprehend the extent of the impact of digital technologies on the development of the field and the practices of scholars. Thus, several questions arise about the type of research that is conducted through the use of this type of resource (topics and methodologies) as well as the related information and scholarly behaviour.

Yet, since it was beyond the purposes of this study to explore further this topic, its design (sampling and data collection process) did not allow for the collection of additional data (apart from the account of Participant 17) that could enable us to generalise and answer such questions with certainty. Nevertheless, based on the above discussion, it is argued here that it is worth investigating further the use of mailing lists throughout different stages of the research process; getting to know the information and scholarly practices associated with the employment of these technologies can lead to better support and infrastructure for scholars. Moreover, conducting research on this area would expand and, potentially, confirm certain arguments made in this thesis.

Therefore, a scoping survey looking at how art historians across various traditional and non-traditional areas (as defined in this thesis, e.g. see pp. 57-58) employ mailing lists in research and teaching would provide the amount of data needed to understand the extent of use and the different purposes that these technologies serve nowadays across different disciplinary areas. To ensure a representative sample of scholars from across the field, the researcher(s) should target relevant art history departments in the UK and beyond for disseminating the survey as well as employing additional sampling techniques (e.g. see chapter 3 for more information on sampling approaches) if needed.

The types of questions included in the survey should aim to trigger answers around the type of research the participants conduct (topics and methodologies), the types of mailing or discussion lists they use, the purposes for which they use these tools, the significance of the information exchanged through them and its usefulness for their research or teaching projects. Regarding the latter point, it is worth including questions regarding the different stages of the research process, such as around idea generation, data collection, collaboration, dissemination. Apart from that, relevant questions around the challenges these scholars face in using this material should also be included; these may refer to issues of trustworthiness of the information, any ethical considerations concerning the use of the material or issues around its management and use (e.g. how to cite this type of information). Finally, during the design of the survey, it will be necessary to provide the opportunity for participants to elaborate on their answers through including text boxes when appropriate. This more qualitative aspect of the survey will prove valuable in understanding the reasons why scholars chose particular answers and, generally, allow for a more detailed view of their practices and behaviour.

Based on the survey results, then, the researcher(s) may want to continue the data collection process through conducting in-depth interviews (face-to-face or online) with certain scholars who provided interesting answers on the issues of interest. Interviewing scholars and asking for relevant examples (e.g. through their personal collections of information) of the types of mailing list material they are interested in as well as the ways they use and manage it will not only enrich the survey data but also enable us to understand the specific requirements these scholars have in terms of tools and services. The combined results of such a project will significantly increase our understanding of the impact of these technologies on art historical research and, potentially, uncover behaviours and needs that have not previously recorded.

To conclude, in this section, our aim was to argue for the importance of conducting further research on the use of technologies such as mailing lists which, according to the results of this thesis, is an understudied area. A research project investigating the issues raised here will foster our knowledge of the modern practices associated with these tools in art history and expand on the results of this thesis.

10.4 Reading Lists and Teaching Materials

According to the results of this thesis, we need to better understand the challenges that scholars face with regards to the organisation, use and management of the information they have in their personal collections. As it became apparent through the accounts of several of the study's participants (e.g. see p. 202), there was a strong link between the organisation and management of information and other core scholarly practices such as writing and the building of the scholarly argument, or idea generation and the planning of future research and teaching activities. Yet, as their collections grew, scholars found it hard to keep track of the information they had collected (e.g. see p. 177) and often had to conduct certain tasks in to order to be able to use them more effectively; such tasks included re-labelling, deleting or re-organisation of information which could be both time-consuming and challenging.

The lack of appropriate tools to help them in related processes was another complicating factor which led many of them to use digital applications and tools for different purposes than the ones they were initially designed for (e.g. see pp. 162-166). Despite their efforts to make the most out of these tools, though, several art historians surveyed in this thesis found it difficult to conduct activities, such cross-referencing of material in the different parts of their collections (e.g. see pp. 175, 182), which would have supported more creative and productive work with information. Since managing and curating large amounts of digital data increasingly becomes a pressing issue for scholars (as argued in p. 226), providing them with greater assistance in managing effectively the information in their collections will foster re-discovery and re-use of this material in research and teaching.

In this last section of this chapter, it is proposed that it is worth further exploring how art historians use and manage the variety of information that exists in their personal collections. The aim will be to develop a more complete understanding of the particular needs they have when conducting relevant activities (including the tools and methods they use) while

focusing, especially, on the factors that affect re-discovery and re-use of information as well as the problems that hinder scholars from taking full advantage of the knowledge that exists in their collections. This could be achieved by employing a methodology that uses personal information management (PIM) theories and models to investigate some of the relevant findings of this thesis in more detail. According to Jones (2005, p. 1), 'Personal Information Management (PIM) refers to both the practice and the study of the activities people perform in order to acquire, organize, maintain and retrieve information for everyday use.'

For this purpose, it is suggested that looking at specific parts of scholars' collections, which can be regarded as sub-collections,[146] may be a more fruitful approach towards the study of matters such as the above. An in-depth examination of the use of certain groups of materials can reveal issues around the extent to which information is re-purposed, the connections that exist between different parts of the collections and the rationale behind certain practices and methods. Thus, the reading lists and other materials that art historians create or collect as part of their teaching constitute suitable sub-collections to use as case studies for future work in this area; it is worth noting that these sub-collections can be accessed, updated and re-used for several years.

In this case, a reading list can be any group of information that is created and used to inform teaching practice or shared with students and colleagues in the context of teaching and learning. The teaching materials can include any information that is used as part of the scholars' teaching activities and is aimed to be communicated and shared with students and, potentially, colleagues. Both reading lists and teaching materials are curated groups of information which are put together for specific purposes (sub-collection). These groups can include information which is collected from external resources or created (e.g. in the form of notes or when re-used from other parts of scholars' collections) and is stored, organised and managed through various tools and by applying personal criteria.

In this thesis, participants' teaching collections were part of the larger personal research collections. Although scholars usually attempted to separate teaching from research material by employing different organisational systems (e.g. separate digital or physical folders), they were often faced with the need to re-discover, re-use or cross-reference material from other

[146] Concerning scholars' personal collections, a sub-collection is part of a larger collection and consists of a curated group of information, put together for a specific purpose.

parts of their collections as their teaching practice was informed to a great extent by their research interests (e.g. see pp. 82-83); this practice regularly resulted in duplicate information or different versions of documents which could prove problematic in the long term (e.g. see p. 182).

In an attempt to tackle some of these issues, several of the art historians in this study experimented with tools and applications easily accessible to them; yet, the fact that related material ended up stored in various devices, tools and physical systems as well as under different organisational structures increased the complexity of information management and use. More specifically, reading lists were in digital format and managed through various tools and applications, such as reference managers (e.g. Zotero), note taking software (e.g. Evernote), Microsoft programmes (e.g. Power Point, Word), blogs and online applications (e.g. see pp. 161-162). Teaching materials were of different formats (physical or digital) and types (e.g. visual, textual, audio-visual) and accessed and managed through various tools, devices or other physical systems (e.g. see pp. 161-162, 167).

According to Whittaker (2011, p. 41), 'fragmentation' is a common problem that prevents users from taking advantage of the material they have collected; this happens when information that is part of a project (or, in this case, a sub-collection built for a specific purpose) is spread across devices and tools. Whittaker's 'curation lifecycle' model (2011, pp. 7-10),[147] a variation of a model by Jones (2007) and Jones and Teevan (2007),[148] includes three areas of activities: keeping, management and exploitation. Based on this model, if the collected information can not be accessed and used (exploited), the effort put into the keeping and management practices has no real value. As Whittaker argued (2011, p. 54), our knowledge around information curation at a personal level is limited; thus, we need to further study the keeping, management and exploitation habits of users in order to be able to support them effectively.

Yet, since successful exploitation of information is strongly linked to the decision making process related to the keeping and management of information (a similar argument was

[147] In brief, 'keeping' refers to the decision making process which takes place when encountering information that is deemed relevant and which leads to gathering it; 'management' entails the choices made and practices conducted after the decision to keep the information and have the purpose of ensuring future access and use of this information; 'exploitation' refers to methods and practices related to the use of the collected information.
[148] This model includes the activities: (re)finding (involves information seeking and accessing practices), keeping (as above), metalevel activities (such as managing and maintaining).

made in this thesis, e.g. see p. 179), it is also important to assist users from the early stages of the curation lifecycle. Studies (e.g. see Papadakis et al. 2015; Obendorf et al. 2007) have shown that, instead of constantly looking for new information on the Web, users tend to frequently search for and access information that they have previously discovered and collected. In this thesis, there were participants with similar behaviour (e.g. see Participant 02, p. 121); this type of behaviour was related to issues around the recording, storing and management of the information in their personal collections which made it difficult to re-discover and re-use material and, thus, easier to look for it again online.

However, since art historians' personal collections often include information that is unique (e.g. visual material they use for research and teaching) and comes from resources that are difficult to re-access, the provision of appropriate tools and support early on in the curation lifecycle becomes essential. Finally, it is worthwhile noting that better support for re-using the material that already exists in scholars' personal collections could also benefit institutions such as research libraries through potentially reducing the costs linked to the acquisition and provision of published materials (especially in the context of subscriptions where they pay per download).

Apart from facilitating the building of personal collections from an early stage, understanding the decision making process behind selecting certain information to create new knowledge can be of value for successfully automating some of the curation lifecycle processes through the provision of appropriate tools and services (Whittaker 2011, pp. 53-54). As Jones (2005, p. 37) argued, users tend to work with groups of materials rather than single items and attempt to understand how different information fit together. Regarding art historians' personal collections, identifying the reasons behind the selection of specific information aimed to be re-used as part of scholars' teaching materials (including reading lists) can lead to more personalised tools and services (e.g. for cross-referencing information); exploring how the re-used material is combined with additional content to form new knowledge for the purposes of teaching can uncover aspects of the sense-making process (as in Dervin 1983) involved in information management and exploitation practices.

Looking at the role of memory in locating and re-using information is also important when drawing requirements for interface design (e.g. see Elsweiler, Ruthven and Jones 2007). Based on this thesis's findings, art historians needed to use their memory in order to create connections between different types and formats of materials, a task which was not easily

achieved through the tools and services they used (e.g. see pp. 195-196). Visual memory, in particular, was found to play an important role in scholars' work with information (as argued in pp. 134-135) and the potential of the physical material to trigger memory was highlighted in several cases (e.g. see p. 173). Jones (2005, pp. 37-38) also stressed the importance of visual memory in making sense of, managing and using information while providing examples showing how the physical material enables personal information management processes.

Thus, several questions arise with regards to the issues raised above. How do scholars choose certain information to use and why? What are the practices involved in re-discovery and re-use and what are the reasons that affect these processes? How can we facilitate the cross-referencing of materials or the use of the materials that are stored in different tools and formats? What can we learn from the way art historians engage with physical material in order to create more user-friendly systems that support re-discovery and re-use?

Building an analytical framework of studies on personal information management and other relevant theories along with a qualitative approach which combines data collected through diaries and interviews with art historians will provide some pertinent insights into related practices. Whittaker's model (2011) puts an emphasis on practices of re-use, curation and preservation of information; for this purpose, it is regarded as a suitable starting point to explore the issues raised here. This can be complemented by Jones (2005) and Jones and Teevan (2007) information management work. Furthermore, the sense-making theory developed by Dervin (1983)[149] and personal knowledge management theories (PKM),[150] which have been frequently employed alongside information management theories to examine the role of the individual in the process of knowledge creation through the use of information (e.g. see Świgoń 2013; Razmerita, Kirchner and Sudzina 2009, Jones 2005), can prove valuable when attempting to draw the requirements for more personalised tools and services. Finally, studies that look at the issue of memory and its role in personal information management (e.g. Elsweiler, Ruthven and Jones 2007) will help understand how we can offer a better user experience in the digital environment.

[149] More information on Dervin's work can be found in the 'Literature Review' chapter.

[150] According to Świgoń (2013, p. 833), 'personal knowledge management has grown out of a combination of fields, personal information management, cognitive psychology, philosophy, management science, education, communications and many other disciplines, and is defined as an evolving set of understandings, skills and abilities that allows an individual to survive and prosper in complex and changing organizational and social environments'.

Regarding the sample of participants, it will be necessary to recruit scholars who are active in both research and teaching in order to examine how research material is repurposed for teaching. Also, having participants from different backgrounds (e.g. working on traditional or non-traditional topics) will bring up interesting issues around re-discovery and re-use of specific information objects (e.g. emerging information objects as in pp. 211-212). The time for collecting the research data needs to be considered as well. It may be better to approach scholars at a time when it is more likely that they are building or updating their teaching collections, including reading lists and other materials (the beginning of an academic year or term); it will be easier for them to report on practices they are conducting at that specific point rather than on past behaviour.

A two-phase data collection will involve asking participants to complete a diary for a specific time period (Elsweiler, Ruthven and Jones 2007 also used diaries as part of their research) where they will note issues around the decision making process that surrounds the building or updating of their teaching sub-collections, including matters of re-discovery and re-use. Art historians participating in this study should be provided with a general briefing on the areas of interest prior to the beginning of data collection; the purpose for selecting specific information, any issues around the use of tools and specific types and formats of information when attempting to re-discover and re-use material from their collections, the role of memory in the process are some of the matters scholars should be asked to reflect on.

The next phase of the data collection will involve interviews with the scholars who completed the diaries in order to clarify issues identified during the first stage. The researcher(s) conducting the study may want to ask art historians to show them relevant examples from their personal collections and use them as a way of further discussing the diary entries. These in depth discussions will enable researchers to gain a better understanding of the way art historians keep, manage and exploit material from their collections and draw requirements for designing tools and services (e.g. around cross-referencing of information) that will facilitate re-discovery and re-use of material in their work.

10.5 Chapter Conclusion

The goal of this chapter was to make methodological suggestions for investigating in more detail some of the results of this study; an in-depth discussion of these findings was

deemed beyond the scope of this research or was not possible due to the study's limitations. More specifically, we focused our recommendations on four areas: social media, art historical libraries, mailing lists, reading lists and teaching materials. Future work on these topics will further our knowledge of art historians' information and scholarly practices with regards to the building of personal research collections and beyond as well as confirm and expand on the findings of this thesis. Finally, a thorough study of art historians' information behaviour in the context of these areas will help gain a sound understanding of their needs which can lead to more user friendly and personalised digital infrastructure and support for scholars in the field.

CHAPTER 11: THESIS CONCLUSION

The purpose of this study was to examine the way art historians create and manage their personal collections in the digital age and understand the needs they have during this process. As discussed in the introduction, the unique characteristics of art history have often led to challenges with regards to the employment of digital technologies in the context of research and teaching. Regarding the work of art historians with information, issues around the types and formats of information objects, access problems and the lack of appropriate digital resources, copyright, cost and other image-related issues have strongly influenced their practices. In this context, this thesis attempted to further our understanding of art historians' relationship with information in the digital age. More specifically, given the limited research existing on scholarly behaviour in the field after the discovery of information, exploring how art historians build their personal information collections used in research and teaching was considered a suitable approach towards uncovering practices conducted 'behind the scenes', at scholars' personal workspace.

Although this study was subject to limitations, the key aspects of this process that were uncovered and discussed as well as the several issues raised throughout the presentation of the findings will foster our understanding of the practices involved in the creation of personal collections, leading to the building of better tools and services to support art historical scholarship. Concerning these limitations, particularly, it was noted in the methodology section that the limited response that was encountered during the call for participation led to the reduction of the target with regards to the number of interviewees, from twenty five to twenty; the decision to stop at this number was also imposed by time constraints. Given that other qualitative studies examining scholarly information in the Arts and Humanities have frequently used a similar number of participants (as also explained in p. 54), the number of our interviewees did not affect the production of useful results which were yielded through in-depth, semi-structured interviews and observation and analysed thoroughly though coding the transcripts.

Thinking about the profile of the users and their grouping in two categories based on whether they conducted traditional or non-traditional research, although it worked for the purposes of this study, we cannot claim that it would constitute a suitable categorisation for

every circumstance and in the context of every project. Moreover, it cannot be argued that the group of scholars studied for the purposes of this project can be fully representative of one or more of the scholarly communities inside a diverse field like art history where there are such a wide variety of topics studied and methodologies employed.

Yet, since the sampling criteria were based on the gaps existing in the related literature (e.g. groups of scholars that have been understudied as opposed to those whose behaviour has been examined more frequently), the interview data provided an insight into aspects of scholarly research which had not been previously discussed; the categorisation of scholars' research followed here also allowed the comparison of the information behaviour of the participants between these two groups when necessary. Finally, since this thesis was subject to time and other project constraints (e.g. word limit), it has not been possible to discuss in detail every issue raised during the interviews that went beyond the scope of this research (e.g. concerning scholars views on their discipline in the digital age or the Digital Humanities); some of the related findings, though, are intended to be published.

Before making suggestions for further research, it is necessary to stress the key findings of this study which demonstrate its contribution to the existing knowledge about the information practices of scholars in the field of art history. Since the goal of this study was to understand the practices that take place during the building of scholars' personal research collections, from the gathering of the material to its use and management, it was necessary to examine the behaviour of art historians' both during the initial and later stages of the research. Given that gathering, being the first step of the collecting activity (Palmer, Teffeau and Pirmann 2009, pp. 16-17), takes place right after the seeking and discovery of information, identifying any relationships between these two different phases of research would allow a better understanding of scholarly behaviour in the field. Moreover, exploring the different uses of personal collections was part of the goal of this study. After comparing our results with the previous literature, the major findings of this thesis are:

11.1 Access to useful digital resources

Art historians still have limited access to digital resources containing primary material and good quality open access visual information, which is digitised and presented according to their preferences and needs. Certain areas of art history which have been understudied,

such as digital art history and non-Western art, face greater difficulties with regards to this issue. In addition, the problems encountered when accessing information could also influence scholars' decisions on whether they would share their resources with colleagues or institutions.

11.2 Emerging information objects

The range in types and formats of information objects sought and collected today is much broader than these described in previous studies; an increase was particularly noted in the use of different types of digital and online material, such as mailing lists, computer graphics or social media and social network data. Yet, these types of information raise several issues with regards to their discovery, gathering and organisation, affecting the information behaviour of the art historians using them.

11.3 Criteria for choosing resources

Considering the criteria for preferring certain resources over others, several of the results presented in the context of this thesis were in accordance with those from earlier studies. Yet, the finding concerning the impact that the design of a digital resource (beyond its searching capabilities) can have on whether scholars would use the resource was an issue that has not been raised before.

Moreover, through examining the criteria upon which our participants chose digital resources as well as the ways they looked and engaged with information, it became possible to draw requirements for interface design for digital resources. Thus, based on the needs of the art historians in this thesis, it was suggested that a simple interface will enable users with different levels of technical skill to interact effectively with information. Given art historians frequent need to browse content in collections and engage visually with information, digital resources targeted to this group of researchers should enable visual exploration and engagement with content. Additionally, including digital object metadata and information around the digitisation process will help scholars make informed decisions when using digital content. Finally, providing the ability to view and download material through various means will satisfy the needs of many scholars who access and manage information across devices and tools.

11.4 Two phases of information seeking and gathering

At least two different stages of information seeking were found to occur in the course of a project where scholars had different information needs during each of them; the first stage was of a more exploratory nature while the second, when conducted, was more specific. In the latter case, a difficulty was noted in finding the right information to meet scholars' particular needs at this progressed stage of their research. As was the case with information seeking, the gathering of information was also found to occur in at least two phases during a project which had different characteristics; gathering at the beginning of research was less selective than that conducted at its later stages.

Although various models including activities related to the building of personal collections were examined in order to reach the above conclusion (e.g. Meho and Tibbo 2003; Shneiderman 2000), Kuhlthau's (1991) ISP model constituted the basis for building our argument as it refers to stages of information seeking rather than features or activities alone. Also, the cognitive aspects of the various information seeking stages described in the model enabled us to identify more easily the two phases of information seeking and gathering our research participants experienced, along with their different characteristics. Therefore, the observations made during our analysis expanded not only our understanding of these practices, but also the model itself by extending and varying it.

More specifically, for the purpose of better understanding the behaviour of art historians, it is suggested that an additional gathering task at the exploration stage called *Exploratory Gathering* should be added; this will follow the *Exploratory Information Seeking* which is conducted beforehand. Moreover, the second gathering task (with the same characteristics as the one described in the model) can be named *Focused Gathering* and will come after the *Focused Information Seeking*.

This information, again, was a new discovery which was a result of focusing on the information practices that follow the discovery of the research material; as there is very little information on how scholars in the field handle the gathered information throughout the course of a project, our knowledge has been limited previously to the information seeking practices that take place at the initial stages of research. Further exploration of the reasons behind the different behaviour that scholars have at the different stages of research (e.g. problematic access or the need for more 'focused' information and, accordingly, the types of ma-

terial needed) can lead to more targeted digitisation of material that is currently unavailable as well as to the creation of digital infrastructure that facilitates the discovery of this information through enhanced searching facilities and useful metadata.

11.5 Information organisation and management: the implications for resource design

Regarding the practices of scholars for managing information, this research's findings not only demonstrated that scholars utilise an even greater variety of means (many of the digital ones have only been briefly mentioned previously), but also have often understood the behaviour behind the use of these means. The different uses of, otherwise, commonly employed tools (e.g. using Microsoft PowerPoint to save images along with relevant metadata and notes) illustrated the needs that scholars had in terms of information management, raising issues that have not been previously recorded. More specifically, intuitive interaction with information, ideally, in visual ways as well as simple interfaces which allow for personal criteria to be applied were the main things that art historians were looking for in an information management tool. The ability to cross-reference different types of material through this tool was also a requirement they had which has not been covered yet even though it first appeared in Bakewell, Beeman and Reese (1988). Finally, such a tool should accommodate the needs of scholars using types and formats of information which fall into the category of non-traditional research, such as multiple-frame art objects or more complex digital objects.

Considering the use of personal collections, it was found that they were used mostly at the beginning and the end of a project. However, scholars often needed to restructure their collection as their understanding of a topic developed or when starting a new project. Thus, flexibility should be a principal characteristic of relevant tools if they are to support scholars' needs; this aspect of art historians' use of their collections and the user requirements with regards to the tools that could facilitate it are key findings which have not been previously stressed. Although some similar issues were raised by Bakewell, Beeman and Reese (1988), the limited employment of digital means by scholars at that time did not allow for detailed reflections on the use of specific tools for such purposes.

Additionally, as their collections grew, scholars found it hard to keep track of the information they had collected and had to conduct certain tasks in to order to use them more effectively, such as re-labelling, deleting or re-organisation of information which could be

both time-consuming and challenging. The lack of appropriate tools to help them in related processes was a complicating factor which led many of them to use digital applications and tools for different purposes than the ones they were initially designed for. Despite their efforts to make the most out of these tools, several art historians in this thesis found it difficult to conduct activities (e.g. cross-referencing of information) which would have supported more creative and productive work with information. Since managing large amounts of digital data increasingly becomes a necessity, providing scholars with greater assistance in handling effectively the information in their collections will foster re-discovery and re-use of this material in research and teaching.

Finally the role of colleagues in forming scholarly habits with regards to information organisation, use and management was a finding which, even though it complements our knowledge about colleagues' part in the facilitation of information seeking, it has not been raised before in the related literature. Actually, it opens up possibilities for incorporating peer support in the design of tools and services as well as in professional development training and support in the field of art history, while also enhancing collaboration.

11.6 Chapter Conclusion

All in all, the above findings demonstrate how the objectives of this study were met, leading to a better understanding of how art historians handle information after its discovery and, more specifically, how they build their personal research collections, what challenges they face and how their practices can be supported accordingly. In particular, our results concerning the emerging information objects in the field and the factors affecting the choice of resources to use, such as access issues or the design of a resource, answered our objectives with regards to the identification of the types and formats of information objects scholars seek and collect as well as the criteria for visiting certain resources to gather them. Furthermore, discovering that there were, at least, two distinct phases of information seeking and gathering where art historians have different needs, not only provides a more complete picture of the practices and needs at the beginning of a project and at the first stages of the building of personal collections, but also enhanced our knowledge concerning the requirements of scholars at more progressed stages; this finding met our objective to comprehend the practices conducted 'behind the scenes', beyond the discovery of information that occurs during the early stages of research.

Moreover, our results with regards to information organisation and management and, particularly, the requirements that scholars had for tools and services to support their practices enabled us to include implications for resource design; this outcome fulfilled our target to understand the different needs scholars had during the building of personal collections and the documentation of the requirements for facilitating their practices with appropriate tools and services. In addition, our initial argument about the importance of personal collections for research and teaching was confirmed through the findings on the use and re-use of information as well as existing attitudes around sharing material. Finally, the different needs that scholars researching on non-traditional areas had both when looking for information and during information management justified the methodological design of this thesis (e.g. sampling criteria based on traditional and non-traditional research projects) and our objective to explore further this issue, first proposed by Rose (2002).

Thinking about the temporality of the findings in this thesis, it is worth stating that they reflect the changing practices of scholars, approximately, over the past ten years. Given that there have been few studies since 2010 (as can be seen in the literature review) looking at how the rise in digitisation activities and the employment of digital tools and methods have affected the information discovery, use and management of information in art history, our findings revealed issues that have not been discussed before. These include new types of information objects; the impact of the resource design on scholars' information seeking behaviour; the problems scholars face during information gathering, use and management. However, aspects of the evolving digital society, including the continuous digitisation efforts and the greater employment of digital research methods across the Arts and Humanities disciplines, are expected to lead to new tools, applications, devices and resources which will affect the information practices of art historians. Thus, it is suggested that further research on the information and scholarly practices of art historians should be conducted at least every five years while some of the findings, such as around social media (due to potentially changing attitudes as explained in p. 235), may need to be revised more often.

To conclude, the results of this study suggested that scholars in the field become increasingly aware of the effect that digital technologies can have on their work, from the seeking of the information to the analysis of their data. Accordingly, it became apparent that, they employ a range of technologies in their daily work routine. However, by focusing in this thesis on an understudied side of art historians' work, the building of personal collections, we

managed to uncover aspects of disciplinary scholarly practice rarely discussed before. Ranging from information seeking to organisation and management issues, they made it evident that art historians' practices and the impact that the digital age has had on them have not yet been fully understood yet. Also, an awareness of the different behaviour and needs of the various sub-disciplinary groups is still lacking.

Nevertheless, the findings of this research have enhanced our understanding of some of the core information practices and needs of scholars related to the building of personal collections, from the gathering of the information to its use and management; thus, it contributes considerably to our knowledge about aspects of art historical practice, such as the practices conducted beyond the early stages of research and the initial information seeking, which have been very underexplored. Finally, this thesis has hopefully brought to the fore issues for consideration for information professionals and other scholars interested in understanding and supporting art historical scholarship with appropriate tools and services in the digital age. As suggested in the previous chapter, further research in the areas of social media, art historical libraries, email lists, reading lists and teaching materials will enhance our knowledge of art historians' information and scholarly practices with regards to the building of personal research collections and beyond as well as confirm and expand on the findings of this thesis.

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APPENDICES

APPENDIX II

Research Participants Information Sheet

Dear Participant,

Thank you for considering taking part at the interviewing process of my PhD research project 'Personal Research Collections: examining research practices and user needs in art historical research'.

Details of the project

Introduction

During the past years, the proliferation of digital resources and the capabilities developed by new technologies have greatly affected the way scholars approach, create and manage information in the Arts and Humanities; thus, it is essential to examine further the scholarly practices and needs of researchers in the digital age. Regarding art history, in particular, the "building" of personal collections was found to have great importance for the research conducted in the field, but there is little information on how scholars handle the collected material afterwards. Consequently, understanding the key role this activity plays in art historical research, as well as the criteria upon which scholars' personal collections are created, designed, used and managed can bring useful results for the facilitation of the research process in terms of customised digital tools and services for scholars.

Aim of the project

The aim of the project is to identify the specific needs of art historians when they create, design, use and manage their personal research collections; this information will help us develop a sound understanding of this key activity in the field and enhance art historical scholarship.

The interviews

The scholars' insights and views during the interviews are valuable for understanding the intellectual process behind the creation and management of a personal collection, such as how

this process is interlinked with an art historical project or how it supports specific research practices. In fact, this is very important if we want to identify the unique needs of the researchers in the field and support them with personalised tools and services.

Interviewing process

Before the interview

The participant will receive via email an information sheet which will keep for his/her record and a consent form which he/she will sign and return back to the researcher. A copy of the consent form will be also provided to the participant after it is signed by the researcher. In addition, the participant will be given the time to ask questions and clarifications if he/she finds it necessary.

During the interview

The interview will be held at a place decided in agreement with the participant (preferably at the participant's workplace). Participation at the interview is voluntary and the interviewee can withdraw at any time and without giving any reason. The interview will take approximately 45min. -1h. and it will be recorded while the questions will focus on issues regarding the scholar's activity of gathering research material and the "building" of his/her personal research collection.

After the interview

When the recordings from the interviewing process are transcribed, each participant will have the chance to review the transcript produced from his/her interview and feedback on it. The results of the interviews will be used in the PhD Thesis of the researcher but they will not be used further without permission. Also, the data will be anonymised since the project has been registered with the UCL Data Protection Service and complies with the Data Protection Act.

For any questions please contact:

Christina Kamposiori
MPhil/PhD Student
UCL Centre for Digital Humanities
Department of Information Studies
University College London
Gower Street, London, WC1E 6BT

Email: christina.kamposiori.11@ucl.ac.uk

Participant Identification Number:

Consent Form

Project Title: Personal Research Collections: examining research practices and user needs in art historical research

Name of Researcher: Christina Kamposiori

Please initial box

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I consent to participating in a recorded interview. ☐
3. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. ☐
4. I understand that at the time of their creation, the recording and transcript have a copyright jointly owned by the interviewer (the researcher) and the interviewee (myself). As a result, I will have the opportunity to edit and approve the transcript created from the recording prior to it being completed. ☐
5. I understand that any information given by me will be used in the PhD Thesis of the researcher and will not be used further without permission. ☐
6. I understand that all data will be anonymised. ☐

_____	_____	_____
Name of Participant	Date	Signature

_____	_____	_____
Name of Researcher	Date	Signature

When completed, please return to the researcher. One copy will be given to the participant and the original to be kept in the file of the researcher.

Interview Guide

1. Could you, please, tell me a few things about your (current) research project(s)?

2. How do you decide to research on a particular subject?

    - What stimulates your interest?

3. What kind of resources do you usually gather for your research? (type and format of resources e.g. textual, visual, multimedia, digital or conventional format)

4. Please, describe how do you go about gathering your resources? (When, where and how, e.g. stage of research, places, people)

    - Which do you find to be the most effective way(s)?

    - Could you show me?

5. Which factors affect your decision on which resources, including the type and format, to gather and why? (e.g. research subject, analytical technique or methodology, colleagues etc.)

6. Please, describe how you go about recording and storing the information you

        - gather for your research (e.g. books, journals, references etc.).
        - create throughout the research process (e.g. notes, reports, outputs etc.).

    - What means do you use for that purpose (conventional and/or digital) and why?)

    - Could you show me?

7. Please, describe how you go about filing, labelling, indexing, and organising information in your personal research collection (data collected and created).

    - On which criteria your decisions are based?

- Could you show me?

8. Do you ever find that different types or formats of resources require different approaches in terms of the above activities (recording, storing, filing, indexing, and organizing) (e.g. textual vs. visual, analogue vs. digital). If yes, why?

9. Do you ever find that the development of your research project (e.g. subject) or methodology you choose affects the above activities (recording, storing, filing, indexing, and organizing)? If yes, in what ways?

10. Do you ever find that you encounter barriers when you store, file or organise your personal collection (conventional and/or digital)?

    - How do you go about overcoming them?

11. Do you ever seek advice regarding these activities (person or resource)?

    - If yes, why do you do that and how do you choose a specific person or resource?

12. How often do you add resources to your personal collection?

13. How do you use your personal collection over the period of a project(s) (current or/and past)?

    - At which stages of research do you use it most and why?

14. What value has your personal collection for your career and research?

    - How would you find the idea of exchanging resources from your digital collection with other researchers or sharing your collection with an institution?

15. If we could provide you with a digital tool for your collection what would you like that to be/do?

16. Would you like to mention/comment on anything else regarding the building of your personal collection (e.g. gathering of resources and the stages of its creation and management)?

Transcript Template

Participant ID: XX Interview Date: DD/MM/YYYY

Project: Personal Research Collections: examining research practices and user needs in art historical research

Participant ID: XX

Name of Interviewer: Christina Kamposiori

Date of Interview: DD/MM/YYYY

Interview conducted at:

Interview started at:

Interview duration:

Photos available: Y/N

Number of photos (if applicable):

Other Information:

Interviewer (I):

Participant (P):

Transcription System

[xxx, time]	Comments on a particular part of the transcript; the time feature was removed at the last version of the transcripts.
[…, time]	One word cannot be heard in the recording; it is considered important and is not replaced. The time feature was removed at the last version of the transcripts.
[…., time]	Two or more words cannot be heard in the recording; they are considered important and are not replaced. The time feature was removed at the last version of the transcripts.
[?, time]	Problems with the spelling of a word. The time feature was removed at the last version of the transcripts.
[unclear, time]	One or more words cannot be heard clearly; they are not considered of vital importance to the meaning of the sentence and are replaced by others with a similar connotation. The time feature was removed at the last version of the transcripts.

APPENDIX III

Kuhlthau's Information Search Model (ISP)

TABLE 2. Information search process (ISP).

Stages in ISP	Feelings Common to Each Stage	Thoughts Common to Each Stage	Actions Common to Each Stage	Appropriate Task According to Kuhlthau Model
1. Initiation	Uncertainty	General/ Vague	Seeking Background Information	Recognize
2. Selection	Optimism			Identify
3. Exploration	Confusion/ Frustration/ Doubt		Seeking Relevant Information	Investigate
4. Formulation	Clarity	Narrowed/ Clearer		Formulate
5. Collection	Sense of Direction/ Confidence	Increased Interest	Seeking Relevant or Focused Information	Gather
6. Presentation	Relief/ Satisfaction or Disappointment	Clearer or Focused		Complete

Source: Kuhlthau 1991, p. 367

Description of the six stages in the ISP model:

Initiation: when the person realises that there is a gap in knowledge or uncertainty and thus, there is the need for information.

Selection: at this stage a topic to be investigated or an approach to be employed is selected. According to Kuhlthau, user's feelings begin to change from uncertainty to optimism as a

choice is made and they are ready to begin the search. In case the selection process is hindered for some reason, the feelings of anxiety may return.

Exploration: involves strategies for seeking and exploring information on a general topic, such as locating information, reading to become informed and relating new information to what is already known. At this phase the main feelings are confusion, uncertainty and doubt, since the user seeks to develop an understanding of the chosen topic. The difficulty in expressing exactly what information is needed may make the interaction with the information system complicated. Constant problems in that case, such as continuously receiving irrelevant information, may frustrate the user and lead to the abandonment of the search.

Formulation: the stage at which a problem needing solution is formulated. Thus, uncertainty at this point gives place to confidence and the thoughts involved concern mainly the selection of ideas based on the information at hand that will help the user develop a particular viewpoint of the topic.

Collection: entails the gathering of the needed material for the topic selected; it includes actions like selecting information relevant to the topic and making detailed notes. Moreover, this is the phase that the user's interaction with the information system becomes more effective. The interest of the developing project is also increasing.

Presentation: at this stage the person ends the information seeking process and gets prepared for reporting and using the outcome of the task. The feelings at this point relate to satisfaction- especially if the search goes well- and user's thoughts focus on the personalised synthesis of the topic or problem based on the discovered information. Strategies for the effective organisation of the material, such as outlining, before the final presentation are employed.

HESA Student and Staff Record for 2012/2013

HESA Data Request **55560**

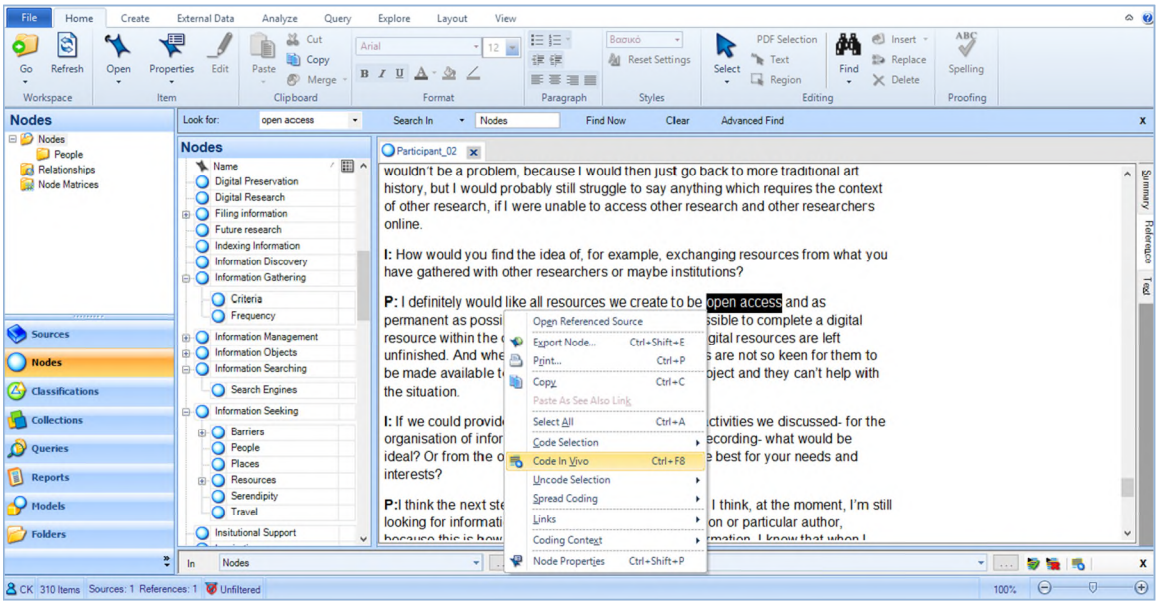
According to the **2012/13** HESA Student Record, the number of students studying (V350) History of art at UK HE providers by Top 10 HE providers was:

HE provider	**Total**
0127 Birkbeck College	**1370**
0201 Courtauld Institute of Art	**405**
0164 The University of York	**365**
0124 The University of Leeds	**330**
0131 Goldsmiths College	**325**
0167 The University of Edinburgh	**310**
0173 The University of St Andrews	**300**
0146 SOAS University of London	**260**
0149 University College London	**250**
0204 The University of Manchester	**235**
Other	**3035**
Total	**7185**

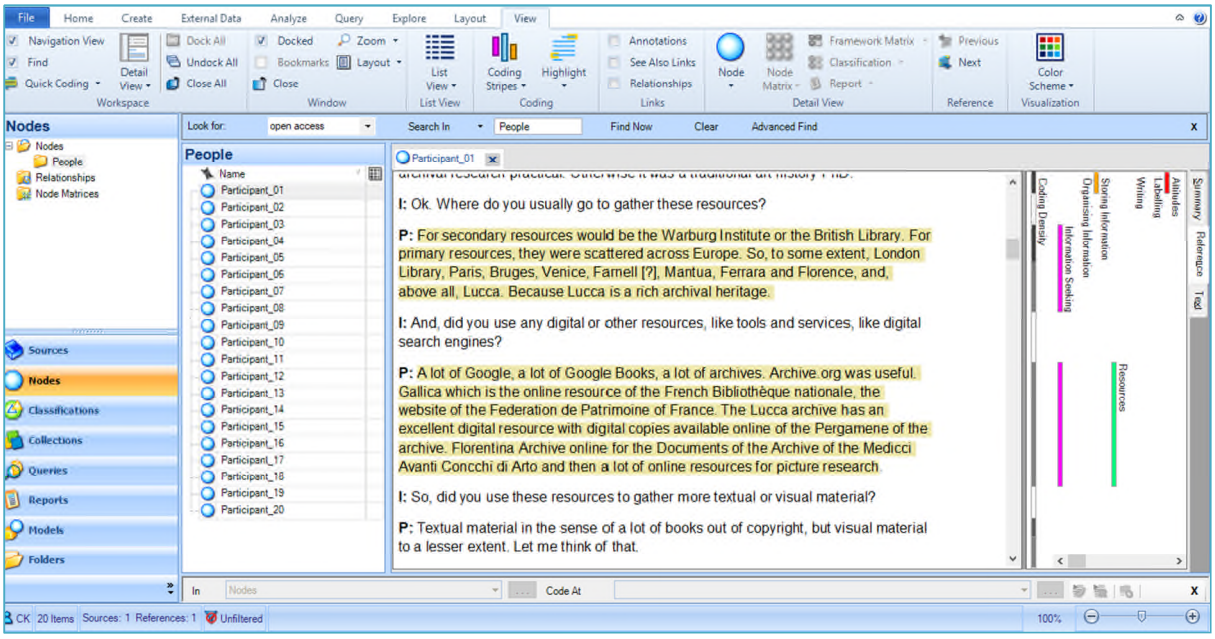
According to the **2012/13** HESA Staff Record, the number of staff with an element of current academic discipline (V350) History of art at UK HE providers by Top 10 HE providers was:

HE provider	**Total**
0001 The Open University	**25**
0201 Courtauld Institute of Art	**20**
0127 Birkbeck College	**20**
0168 The University of Glasgow	**20**
0173 The University of St Andrews	**20**
0024 University of the Arts, London	**15**
0149 University College London	**15**
0122 The University of Kent	**15**
0204 The University of Manchester	**15**
0156 The University of Oxford	**15**
Other	**240**
Total	**420**

Examples of coding via NVivo



Example of 'in vivo' coding through using the words 'open access' in Participant 02's transcript.



Example of text coded under the theme 'information seeking' (purple coding stripe) from Participant 01's transcript.