THE ARCHIVAL TRUSTWORTHINESS OF DIGITAL PHOTOGRAPHS IN SOCIAL MEDIA PLATFORMS

by

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Abstract

No longer objects held in the hand, photographs are streams of bits, shared instantaneously across screens. From selfies to war reportage, the widespread use of smartphones for taking digital photographs and transmitting them to social media platforms is introducing new social practices, technological processes and legal contexts for record-making and recordkeeping, which impact the trustworthiness of digital photographs.

This dissertation investigates current information practices by individuals for creating, managing, sharing and storing digital photographs. The research focuses on the factors that support or hinder the reliability, accuracy and authenticity of digital photographs. Using a qualitative research design, it explores how individuals' activities and perceptions impact the value of digital photographs held in social media platforms as potential records to be acquired and preserved by archival institutions. A web-based survey reached social media members worldwide, and semi-structured interviews gathered in-depth data from a sample of survey participants.

The research found that individuals are members of multiple social media platforms and are actively sharing large quantities of personal digital photographs with friends, social media communities and the open Web. It also revealed that individuals are adding contextual information to their digital photographs, before and after upload to social media platforms, for the purposes of communicating the intent of the photographer and the meaning of the photograph, and of participating in storytelling; however, the procedures for managing and storing user-generated content performed by social media services place the digital photographs

and their associated metadata at significant risk of alteration and loss. The research found that the policies of social media services are buried within complex Terms of Use that few members read, introducing the potential for individuals to accumulate personal digital collections or archives online without understanding the extent of ownership, privacy, reuse, and future access. The research found that individuals' attribute long-term value to the copies of digital photographs held on their personal devices prior to sharing online; whereas, the copies circulated in social media platforms are ephemeral, quickly consumed and then forgotten. Individuals have not made plans to delete, transfer or preserve collections of photographs held within social media services.

Preface

This dissertation is original, independent work by the author, Jessica Bushey.

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Data collection reported in Chapters 4 and 5 is covered by UBC Ethics Certificate H14-00546.

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List of Abbreviations

AIPP	Australian Institute of Professional Photography
ASMP	American Society of Media Professionals
BAPLA	British Association of Picture Libraries and Agencies
CEA	Canada Evidence Act
DAM	Digital Asset Management
ERMS	Electronic Records Management System
Exif	Exchangeable
HCI	Human Computer Interaction
InterPARES	International Research on Permanent Authentic Records in Electronic Systems
IPTC	International Press Telecommunications Council
GPS	Global Positioning System
JEITA	Japan Electronics and Information Technology Association
LEDE	Law of Evidence in the Digital Environment
NPPA	National Press Photographers Association
OWS	Occupy Wall Street
PARADIGM	Personal Archives Accessible in Digital Media
PDA	Personal Digital Archives
PIM	Personal Information Management
SCA	Stored Communications Act
STS	Science and Technology Studies
SWGIT	Scientific Working Group - Imaging Technology
TOU	Terms of Use

Acknowledgements

I don’t know the exact date that I fell in love with photographs, but I have been under their spell for most of my life. First as a young girl pouring over family photo albums, later as a professional photographer and now, as an archival scholar. This dissertation would not have been possible without the support of my family; the inspiration of my husband; and the guidance of my advisor, Dr. Luciana Duranti. I count myself fortunate to have had the opportunity to work with the eminent Dr. Duranti on both my master’s thesis and my doctoral dissertation. I would like to thank the members of my supervisory committee: Dr. Kellogg Booth for his insightful analogies; Professor Anthony Sheppard for his depth of legal knowledge; and Dr. Victoria Lemieux for her guidance on methods in the early stages of my research. I would also like to recognize the valuable contributions made by my external examiner, Dr. Seamus Ross and university examiners, Dr. Alfred Hermida and Dr. Izak Benbasat. The opportunity to have artist and Associate Professor Manual Piña chair my oral defence complemented the interdisciplinary nature of my research.

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Dedication

This dissertation is dedicated to my General Manager, Cam Andrews.

No matter what obstacles I encountered, you always said the right thing to motivate me and get me back in the game. This is our victory.

Chapter 1: Introduction

There has been a revolution in photography that has seen it move from the analogue, chemical-based process that existed for a century and a half to a digital, pixel-based process that deals less with atoms and more with bits. Traditional photographic practice was characterized by largely manual procedures, in which the professional photographer focused on composing the photograph, developing the film and producing photographic prints for specific purposes, including exhibition and publication; and the amateur photographer typically took the photograph, but relied on professional services for film development and print production. In both cases the preservation of photographic film and prints was the responsibility of the photographer and involved storage in physical enclosures (e.g., photo albums, slide trays, boxes and filing cabinets).

Current photographic practice is characterized by sophisticated computer algorithms to create and manipulate digital images in ways that were unimaginable even a few decades ago. In parallel with this revolution in image creation and production, the emergence of social media as a pervasive international phenomenon has radically changed how photographs are viewed and shared by millions of people on an almost instantaneous basis. As a result, the research on contemporary photographic practice being discussed in this dissertation explores smartphones and social media platforms as integral parts of digital photography creation, management, sharing/use, storage and preservation. This dissertation examines the consequences that the intertwining of these two advances has for the particular field of archival science, but also for other fields such as the law and journalism, in which photographs are relied upon as trusted visual evidence of persons, actions and events. This is done through a formal study of

individuals' contemporary photographic practices involving mobile capture devices and social media platforms, the policies and procedures of social media providers, and individuals' perceptions of social media platforms as repositories for ongoing access and long-term preservation of digital photographs collections

The findings of this study suggest that the focus of photographic practice has shifted from memory-making to experience-sharing. Individuals are creating huge quantities of digital photographs with mobile devices, such as smartphones and sharing images through social media services at a magnitude that is unprecedented. Personal photography, no longer hidden between the pages of a family photo-album, is being instantaneously shared with family, friends, social media members and the open Web. As a result, individuals are balancing concerns for protecting privacy with the desire for public attention. Many of the traditional approaches to creating, managing and preserving digital photographs as trustworthy records are changed by the integration of technologies, social practices and cloud-based services that emphasize the immediate over the long term. Photo-sharing and social networking sites provide a variety of features and functionalities to support different types of photographic practice and encourage new forms of social engagement, but they have a hidden cost. The procedures for managing and storing user-generated content performed by social media services often remove contextual metadata linked to the digital photograph, alter the presentation of digital image files and change the privacy settings for personal photographs. While some individuals are aware of these practices and the risks they introduce, many others are not. Members' ignorance of service providers' procedures are due in part to a lack of transparency by the providers in presenting members with access to documentation that clearly explains procedures conducted by the service

on behalf of members and the legal parameters guiding ownership, reuse and future access to user-generated content shared through social media platforms. Lastly, individuals have not taken steps to ensure the deletion or transfer of their social media accounts and digital photographs collections in the case of death. As a result, accumulations of personal digital archives stored on social media platforms remain under the control of service providers for future reuse and monetization.

1.1 Overview

In the early 1990s, digital technology presented an opportunity to transform film-based photography and expand photographic practice into something unknown – heralded as "photography after photography" and "post-photography" (Mitchell 1994; Druckery 1994; Amelunxen, Iglhaut and Rötzer 1996; Batchen 2001). The *digital turn* in photography prompted photographic and cultural theorists to raise questions about the adequacy of existing theories of visual representation to address the changes being introduced by digital technology (Lister 1997; Batchen 2001). Concepts attributed to the photographic process, such as original, referent and evidence were no longer applicable to digital imaging. The materiality of film and photographic prints was quickly being replaced by virtual images composed of numerical values. The era of Photoshop was ushered in.

Many professions were impacted by the emergence of digital imaging technologies, particularly law enforcement, photojournalism and art, in which photographs were required to meet standards of reliability, accuracy and authenticity. For the general public, digital photography was introduced by the commercial imaging industry as simply the next step in the evolution of

picture taking. It wasn't until cameras converged with mobile phones, and later with smartphones that provided connectivity to social media platforms that digital photography became a daily activity and everyone became a photographer. The magnitude and frequency of contemporary photographic practice, which is born digital and viewed on screens, is difficult to fathom. In 2015, Instagram, reported uploads of 80 million images per day and 40 billion images shared since the site launched in 2010 (Instagram 2015). Based on these numbers, one could argue that digital photography is central to contemporary communications and thus worthy of research.

In order to gain an understanding of how contemporary photographic practice is being conducted and to identify the factors that support or inhibit archival strategies for acquiring, managing, preserving and providing access to digital photographs as trustworthy records, the research study reported in this dissertation examines contemporary photographic practices of individuals who use smartphones and social media platforms to create, share and store their photographs.

This introductory chapter identifies the research problem addressed by the study and situates it within the larger context of relevant literature and prior studies. It then presents the specific research questions that have guided the author throughout all phases of the study, and outlines the theoretical framework that was adopted, including definitions of key concepts that may be unfamiliar to some readers. The structure of the dissertation is summarized at the end of the chapter.

1.2 Identification of the Research Problem

The taking and sharing of digital photographs enabled by the convergence of cameras with mobile communication devices, such as phones, tablets, and wearable devices that provide connectivity to social media platforms and facilitate the flow of digital images from individuals to global online audiences has become a cultural and social phenomenon and has fostered a revolution in visual communications. No longer limited by the cost of film or the length of time to develop photographic prints, people are approaching photography differently, taking and sharing more images. This can be observed in people's habitual "snapping" of images on their smartphones, often taking dozens at a time, during any event (Van House 2011).

Media and cultural theorists suggest that the increase in production and consumption of images is transforming photography from an act of preserving memories to one of real-time communications, due in part to the convergence of cameras with mobile phones. (Ritchin 2013, 11): "Pictures become more like spoken languages as photographs are turning into the new currency for social interaction" (van Dijck 2008, 62). Influenced by new technological and socio-cultural practices, personal photography and its uses are evolving and acquiring the characteristics of connectivity, performance and ephemera (Bushey 2014). In contrast to Barthes' theory of the ontology of the photographic image as representative of "having been there," the immediacy and frequency of contemporary photographic practice involving mobile devices for creating images and social media platforms for sharing and storing images speaks less about something that happened in the past and more about what is happening right now (Sandbye 2012; Rubinstein 2015). Furthermore, the materiality of the photographic print and its' long-term value has been replaced by the flow of digital images across screens–fleeting in both duration

and value. These developments are potentially disruptive to the traditional memory-making function of personal photography and as a result, are of interest to scholars in the areas of photography, archival science and memory studies.

Social practices of sharing personal digital photographs have not diminished the reception and use of digital images as documentary evidence of events, persons, places and things that once existed in front of the lens. “Photography, like other media, is made to continue fulfilling a role not unlike the ones it was assigned prior to the current media revolution” (Ritchin 2013, 12). In the 1990s, cultural and photography theorists engaged in debates about the threat to the “truth-value” of photographs in digital format, due to the seamless manipulation of pixels, which can be performed easily with commercially available imaging software (Mitchell 1994; Lister 1995; Druckery 1996; Batchen 1997).

A key text at the time was *The Reconfigured Eye: Visual Truth in the Post-photographic Era* (1994), by William J. Mitchell, in which he asserts that new methods for evaluating the “truth” of a digital photograph are needed (Ibid, 31). He proposes a method that contrasts a photograph’s context with its content, which he explains is achieved through assessing the reliability, accuracy and authenticity of the digital photograph and then measuring this documentation against other testimonies of historical evidence (Ibid, 43-49). For professional photographers working in areas concerned with the trustworthiness of digital photographs (e.g., photojournalism) Mitchell’s exercise reveals the importance of supporting documentation to re-associate context and content in the absence of a physical original.

Arising from these discussions was a reassertion by theorists and photographers that photography has always been an interpretive practice and that the meaning of any photographic image (film or digital) is contingent upon the context of creation and use (Sekula 1982; Lister 2004; Price and Wells 2004). It was determined that the genre of “straight” photography, used in the fields of medicine, science, journalism, and the law, required specific controls and procedures to ensure the accuracy and reliability of digital photographs and to protect their authenticity.

In response, several industry-specific approaches were developed to ensure that digital photographs, like analogue photographs, could be created and maintained as trustworthy records (i.e., able to be relied upon as accurate, reliable, and authentic). The purpose being, to support internal decision-making, meet ongoing business needs, provide accountability, and comply with regulatory and legal requirements. The approaches include standard operating procedures (SoP) for creating, managing and storing digital photographs in the criminal justice system (SWGIT 2010) and best practices for professional photographers (ASMP 2012), ethical guidelines for photojournalists (NPPA 1999), and international photo metadata standards (JEITA 2002; IPTC 2015). The emergence of social media platforms has introduced new opportunities for digital photographs to be simultaneously disseminated and accessed by millions of people around the world. As a result, the relevance of earlier approaches developed for digital photographs managed in closed systems for ensuring the trustworthiness of digital photographs shared and stored on social media platforms is being raised.

Commencing in the 1990s, the archival community conducted a number of research projects investigating the area of electronic records (a widely used term prior to the adoption of the term

digital records). These projects' objectives included: identifying and defining the conceptual nature of electronic records (UBC Project 1994-97); testing existing archival theory and diplomatics (see below) concepts and methods for establishing the reliability and authenticity of electronic records (InterPARES Projects 1-3 1998-2012); developing requirements for electronic recordkeeping systems (Pittsburgh Project 1994-96); and exploring the electronic records of individuals (PARADIGM 2005-2007). Emerging from these studies was the recognition that digital technology had not only increased the number of records being made and distributed; it had also provided more opportunities for them to be created haphazardly, to be mismanaged and even permanently lost. More importantly, the plethora of devices and applications for creating digital records in the workplace had decentralized controls over the creation of records, calling into question the reliability of records in use by their creators; whereas, the ease of manipulation, the fragility of the media, and the problem of technological obsolescence were obstacles to presuming the authenticity (i.e., identity and integrity) of records over time and through technological changes (Duranti and Blanchette 2004).

The findings of these research projects suggested that new approaches to the creation, management, use and preservation of digital records were needed, so that creators did not accidentally change or intentionally manipulate records; and preservers could be assured that the records they were tasked to preserve were the same as those that had been received. The vulnerability of digital records to loss and alteration required creators to make choices and perform activities that would ensure the longevity of records and provide assurance that they had not been tampered with. One approach involved the participation of archivists in the management of records throughout their lifecycle and identified the need for creators to perform

preservation activities to support ongoing access to digital records prior to archival acquisition (or in its absence, as is often the case with private records). The products of these research projects were disseminated in the form of guidelines to assist both organizations and individuals in creating, managing and preserving their digital materials in a manner that would fulfill ongoing business needs, provide accountability, and support future reference and acts of remembering (Thomas 2007; Duranti and Preston 2008).

The recent arrival of social media platforms and cloud-computing services[1] has presented an opportunity for archival scholars and practitioners to re-examine existing guidelines and recommendations and conduct studies to explore new contexts of records creation, use and preservation to determine the risks posed by these new services to record trustworthiness. Currently, approaches to image-making and recordkeeping practices of individuals using smartphones and social media platforms are ad hoc, shaped mainly by the combination of available devices, software and services. The enabling technologies (i.e., the confluence of mobile capture devices, imaging applications, networking protocols, standards and platform infrastructure) remain, for the most part, hidden from the creators and beyond their control. Additionally, the legal context of sharing and storing digital photographs in social media platforms, including the rights of the platform provider to terminate members' accounts and license the use of members' content, is buried within a number of policies that many social media members skim over before joining, or never read at all (Buntrock et al. 2013).

[1] Cloud computing is defined as: "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Mell and Grance 2011, 1).

Archivists and information professionals are beginning to recognize the potential risks to record trustworthiness presented by these new services. Initially dismissed as purely social sites (e.g., Friendster, MySpace), social media communities now include governmental agencies, corporations, universities, organizations and individuals. The growth of membership and the volume of business and personal communications being conducted through social media platforms have transformed these services into vital international networks. The following list includes newsworthy events in which the first photographs taken and shown to the world were captured on mobile phones and disseminated through social networking sites: the 2005 bomb attacks on public transit in London, the 2009 Iranian election protests, the 2011 political demonstrations in Tunisia, Egypt, Tunisia etc. referred to as the Arab Spring, and the 2011 Occupy Wall Street Movement (Gürsel 2012). These are visual records with permanent value, created by individuals, often at great risk to personal safety. They represent a view of history from the bottom up and should be preserved so that they can be consulted for the purposes of obtaining evidence and understanding the past. These concerns are central to this dissertation and are expressed in the overarching research question: How do we ensure the archival trustworthiness of digital photographs shared and stored in social media platforms.

The research reported in this dissertation focuses on the activities of the creators of photographs and the policies of social media service providers. It also explores social media members' perceptions of ongoing access to their social media accounts and the long-term preservation of their collections of digital photographs shared and stored on the platform. The research also seeks to determine whether individuals are relying on social media platforms as temporary or long-term repositories for their digital photographs collections.

The focus of the study has been chosen to explore the proposition that, without knowledge of digital image-making and recordkeeping practices and a better understanding of creators' expectations of social media platforms and the policies of service providers, it is difficult for the archival profession to determine the challenges facing individuals and communities pursuing the preservation of their digital archives, as well as the potential obstacles to archival and cultural heritage institutions acquiring organizational and private fonds that include large amounts of social media content.

An in-depth review of relevant literature is presented in Chapter 2; however, it is important to recognize that, when the research for this dissertation began in Fall 2011, there were very few research projects and studies addressing contemporary digital photography practices from an archival or information management perspective.

The first prior study that was reviewed was a qualitative survey that explored digital recordkeeping practices of professional photographers using the archival-diplomatic framework developed by the first two phases of the International Research on Permanent Authentic Records in Electronic Systems (InterPARES), to assess the degree to which professional photographers' activities of creation, use and preservation contribute to record reliability and authenticity (Bushey and Braun 2007). Contemporary archival diplomatics is the integration of the principles and concepts of diplomatics (the study of the genesis, form and transmission of documents in order to establish their authenticity and reliability) with those of archival theory (i.e. the body of knowledge about the nature of records in their aggregations, their relationships, forms and functions). Luciana Duranti introduced diplomatics to the North American archival community

and developed it to address contemporary records in a series of articles published in *Archivaria* between 1989 and 1992 (and later in the book *Diplomatics: New Uses for an Old Science*). Later, in the UBC Project (1994-96) Duranti, Eastwood and MacNeil used contemporary archival diplomatics to develop a conceptual model of an authentic record. This research was followed by the InterPARES Projects 1 and 2, which used contemporary archival diplomatics as a methodology for analyzing the context and characteristics of digital records to determine their authenticity (Duranti 1998; Duranti, Eastwood, and MacNeil 2002; MacNeil 2004).

The second prior study that was reviewed focused on personal information management (PIM) and recordkeeping practices of amateur photographers who take artistic photographs (Spurgin 2011). Spurgin's findings identified the importance of capturing technical and descriptive image metadata during creation, use and management activities to establish provenance and provide context; such metadata in turn facilitate access and retrieval of digital photographs in large collections and support later activities of preservation conducted by archivists. The findings of both Spurgin and Bushey and Braun's research are relevant to professionals and amateurs working with digital photographs and personal archives. The absence of mobile phones and social media platforms from the practices of these creators limits the application of these findings and related recommendations. However, the importance of established procedures for capture, management and storage is still relevant, along with the role of image metadata and strategies for ongoing activities supporting long-term preservation.

The third prior study that was reviewed explored individuals' personal information management (PIM) activities that occur after the creation of digital photographs and prior to sharing (Kirk et

al. 2006). It is informed by human computer interaction (HCI) and software design, focusing on how search and browse tools are incorporated (or not) into individuals' use of their own personal collections of digital photographs, with the aim of providing a context in which new digital photo-management tools can be assessed. The results of the study identified the growing importance of sharing personal digital photographs online, but the issue is only mentioned as one of many different modes of sharing, such as viewing images on a laptop, printing photographs, sending emails with photo attachments and posting to websites, blogs or "*Flickr*" (Ibid).

The fourth prior study that was reviewed explored individuals' personal photography and collocated sharing in analogue and digital practices (Van House 2009, 2011). The study is informed by science and technology studies (STS) and addresses photographic practices and technologies, including camera-phones and online sharing of digital images. The findings provided insight into the differences between analogue and digital practices in the context of personal photography. Van House discusses the increase in the volume, frequency and sharing of digital photography (Van House 2011, 127-128). She emphasized the fragility of digital photographs collections due to individuals' infrequent organizational activities (Ibid, 129). The findings of Van House's study provide a strong foundation on which to explore contemporary photographic practices in greater detail, and invite an exploration of newer technologies, such as smartphones and social networking sites. The fact that Van House did not address the legal and regulatory environment established by the policies of social media service providers identifies it as area to explore further in this dissertation.

1.3 Research Questions

The research discussed in this dissertation is intended to be an exploratory study of an emerging documentary phenomenon and thus should be understood as an initial attempt to formulate new concepts that can be considered for future research on photography and personal digital archives stemming from various disciplinary perspectives and employing different theoretical lenses. The primary purpose of the current research is to gain an understanding of contemporary photographic practice involving mobile/smartphones and social media platforms, in order to inform strategies for managing and preserving social media photographs as trustworthy records.

The research questions for this study were developed through an analysis of issues raised by a review of literature and prior research projects and studies in three fields: archival science and information studies, photography and new media studies, and the law. In addition, the author's experiences over several years in research projects investigating aspects of the online environment, such as the Law of Evidence in the Digital Environment (LEDE) – specifically, the admissibility of photographs from social media platforms as legal evidence, and the InterPARES Trust Project – specifically, the development of recordkeeping requirements for cloud-computing services to support organizations reviewing boilerplate cloud-service contracts, have contributed to the generation of these research questions. As the study progressed the research questions were revisited and refined in response to new ideas and issues that emerged during data collection and analysis.

The study is guided by the following overarching research question:

Overarching Research question: How do we ensure the archival trustworthiness of digital photographs shared and stored in social media platforms?

The first phase of the study involved data gathering through a web-based survey questionnaire. In this phase there were four primary research questions that informed the thirty questions asked in the questionnaire:

Research question 1: In regards to digital photographs, what is the primary purpose that individuals are using photo-sharing and social networking sites for?

Research question 2: Are individuals who use photo-sharing and social networking services to store their digital photographs concerned with trustworthiness (i.e., authenticity, reliability and accuracy)?

Research question 3: Are individuals aware of the risks posed by social media platforms to the trustworthiness of their collections of digital photographs?

Research question 4: Are individuals who use photo-sharing and social networking sites aware of the challenges presented by social media platforms to continuing access and long-term preservation of digital photographs collections?

The second phase of the study involved semi-structured interviews with selected survey participants who volunteered to participate in follow-up interviews. In this phase there were four

follow-up research questions that informed the interview questions and provided an opportunity to explore responses to the survey in greater depth. The initial follow-up questions were revised following analysis of the survey data.

Follow-up research question 1: To what extent do contemporary photographic practices involving mobile/smartphones and social media platforms differ from earlier film-based photography?

Follow-up research question 2: To what extent do contemporary photographic practices impact the reliability and accuracy of digital photographs?

Follow-up research question 3: To what extent do current social media service providers' policies and procedures for managing and storing digital photographs influence the authenticity (i.e., identity and integrity) of digital photographs?

Follow-up research question 4: What are individuals' perceptions about the continuing access and long-term preservation of digital photograph collections on social media platforms?

1.4 Theoretical Framework

The theoretical foundation of this study is provided by contemporary archival diplomatics. By combining archival science, which supports the understanding of the documentary and functional relationships of records in aggregations, and contemporary diplomatics, which supports the

identification of the necessary and sufficient attributes of digital records, the approach is an adaptation of traditional diplomatic concepts and methods to contemporary recordkeeping environments and an integration of those concepts and methods with archival science to assist in determining the requirements for preserving trustworthy records regardless of changes in recordkeeping technologies (Rogers 2015, 22; Duranti 1998, 21). Archivists working with contemporary archival diplomatics have established that trustworthiness consists of reliability, accuracy, and authenticity; thus, a trustworthy photograph must be simultaneously reliable, accurate, and authentic (Duranti 1998; MacNeil 2004; Duranti and Preston 2008; InterPARES 2 Project 2008, 49; McKemmish and Gilliland 2013).

If we want assurance of the trustworthiness of a photograph we need to verify that the photograph is capable of standing for the facts to which it attests (i.e., it is reliable), has a content which is correct and free of error or distortion (i.e., it is accurate), and is what it purports to be, having not been corrupted or tampered with (i.e., it is authentic). The qualities of reliability, accuracy and authenticity are independent. Reliability is provided by the competence of the persons concurring in the formation of the photograph, controls over the procedure of its creation, and its completeness. Accuracy is provided by the controls established over content creation and transmission. Authenticity is provided by a photograph's identity (i.e. the whole of the attributes of a photograph that characterize it as unique and distinguish it from other photographs, such as date(s) of creation and transmission and name of photographer) and its integrity (i.e., the completeness of a photograph, its ability to convey the message that it was meant to communicate by its creator in order to achieve its purpose when it was made).

Situated within an interpretive framework, the qualitative study discussed in this dissertation employs archival diplomatic theory and methods to explore the contexts, structure and content of digital photographs shared and stored in social media platforms and to gain an understanding of the circumstances of a digital photograph's creation, use and storage. It also incorporates photography and new media theories about photographic representation, media convergence and materiality (Rubinstein and Sluis 2008; Jenkins 2006; van Dijck 2008; Zylinska 2010). In doing so, the study discussed in this dissertation explores social media photographs as part of a continuum of image-making practices that are shaped by social, cultural and technological forces. Current methodological approaches to understanding the role of social media platforms in communication and recordkeeping practices are also relevant to this study, specifically as a method to explore the influence of social media platforms on the management and custody of digital photographs collections.

Two recent studies on death and memorialization in social media platforms, conducted by scholars in information science and computing and information systems, utilize the "platform as a lens" to discuss post-mortem related activities in social networking and photo-sharing sites (Acker and Brubaker 2014; Gibbs et al. 2015). Their approaches are inspired by the work of Tarleton Gillespie on the politics of platforms, in which he explores the evolution of media platforms, that is, how online services of content intermediaries, such as YouTube operate and the tensions that arise when offering free hosting services while at the same time making a profit from advertising and exploiting information about members using the service (2010). Acker and Brubaker and Gibbs et al., present their own interpretations of how media platforms operate - respectively, the platform perspective and platform vernacular (Gillespie 2010). Platform

perspective refers to the affective role of the social media platform as service provider and content intermediary, controlling everything from how data is exchanged to who can access user accounts in the future (Acker and Brubaker 2014). Platform vernacular refers to unique combinations of styles, grammars, and logics that emerge within communication practices conducted through social media platforms (Gibbs et al. 257). Although some features are shared across online platforms (e.g., hashtags), every platform "has a vernacular *specific to it* that has developed over time, through design, appropriation, and use" (Gibbs et al. 257).

The theories presented by Acker and Brubaker and Gibbs et al. provide a perspective of social media platforms that contributes to a deeper understanding of how social media platforms as both service provider and content intermediary provide a unique experience that not only shapes the interactions of users on the platform, but also influences the way that individuals approach photographic practice. This understanding is helpful for framing the discussion in this dissertation of the technological and legal issues that impact the trustworthiness of digital photographs shared and stored in social media platforms.

1.5 Dissertation Structure

Chapter 2 presents a review of the literature on digital photographs and social media platforms and contextualizes the aims of the research in accordance with relevant disciplinary perspectives.

Chapter 3 presents the research design for the study that was conducted, providing the theoretical foundations of the study and a rationale for the methodological approach.

Chapter 4 and 5 present the two phases of the study, a web-based survey and semi-structured interviews with individuals who use photo-sharing and social networking services to access, share and store digital photographs.

The final chapter presents a discussion of the combined findings, implications, recommendations, and conclusion.

Chapter 2: Literature Review

2.1 Introduction

This discussion of the trustworthiness of photographs stored in social media platforms begins with an examination of the development of the basic concepts. An extensive review of literature containing commentary on trustworthy digital photographs shared and stored on social media platforms (i.e., networking services with interfaces that support user-generated content) has shown that three areas of knowledge should support the discussion: contemporary archival diplomatics, which provides the theory that is at the foundation of this study; photography and new media, which address trustworthiness as a characteristic of photographs (regardless of media type) and introduce new characteristics of convergence, connectivity, ephemerality and performance to define social media photographs; and evidence law, which establishes how social media photographs are to be assessed as evidence in court proceedings and discusses the importance of contractual agreements between social media service providers and consumers for determining the ownership, stewardship and reusability of user-generated content.

Archivists working with photographic records and archival scholars interested in the interpretation of photographs contained in archival fonds are continually re-examining the nature and function of archives in light of new communication technologies, challenging concepts about the nature of memory and evolving social constructions of truth, evidence and identity (Schwartz 1995; Bushey 2005; Schlak 2008; Keenan 2011). The cultural heritage community recognizes that lives are increasingly being experienced through online interactions (John et al. 2010) and that it is the responsibility of records professionals (i.e., records managers, archivists and curators) to provide some assurance that digital records, particularly those created, shared and

stored in social networking sites and photo-sharing sites, can be preserved in a manner that establishes and maintains some degree of trustworthiness (Acker and Brubaker 2014). At this early stage only a few studies explore aspects of recordkeeping in social networking communities and consider the issues around providing future access to networked personal archives (Van House and Churchill 2008; Van House 2009,2011; Besser 2013; Marshall and Shipman 2014; Acker and Brubaker 2014). However, the level of interest in this topic area is growing quickly, possibly in response to increasing global adoption of social networking sites for business and leisure activities and the resulting centrality of social media communications to our daily lives. This dissertation explores ideas and approaches to contemporary photographic practice involving mobile/smartphones and social media platforms. The examination of the concepts and the terminology used to express them within each discipline provides an opportunity to compare, contrast and reconcile differences in order to gain a clearer understanding of what constitutes trustworthiness in the context of social media photographs.

This chapter is divided into sections corresponding to disciplinary areas: archival diplomatics, photography, and the law, each of which is further divided into subsections that explore the key issues raised in relevant literature, studies and case law.

2.2 Archival Diplomatics

The approach taken in this dissertation combines the theory, principles and methods of archival science with the concepts and methods of diplomatics, and applies them to the analysis of social media photographs for the purpose of gaining an understanding of how digital photographs are being created, shared, reused and stored in the context of mobile/smartphones and social media

platforms. Initially developed as a theoretical framework by the International Research on Permanent Authentic Records in Electronic Systems (InterPARES) 1 Project (1998- 2001) at the University of British Columbia, archival diplomatics provides an integrated approach and a conceptual model which can be used to explore emergent forms of visual documentation, assess strategies for creating, managing and preserving digital records, and support archival and forensic methods of authentication (MacNeil 2002; Duranti and Preston 2008; Duranti 2009). The following section introduces the foundation of archival diplomatics, drawn from principles of archival science and concepts of diplomatics, but contextualized in the digital environment, a context which has raised challenges to existing paper-based recordkeeping practices utilizing methodologies based on early archival theory.

2.2.1 Theoretical Foundations

Archival science is concerned with aggregations of *records* (i.e., documents made and/or received by a person or organization in the ordinary course of personal and business affairs, and set aside for further action and/or reference) and examines the documentary and functional relationships among records (Duranti 1989, 10). Archival theory is the whole of the ideas that archivists hold about the nature of archival materials, their essential characteristics and their common properties (Eastwood 1994). Archival methodology is the principles that archivists hold about how to treat archival materials, including among others, the core principles of *provenance*, *original order* and *legitimate unbroken custody*. These core principles "were designed precisely in order to preserve records as evidence of the functional-structural context and actions that caused their creation" (Cook 2013, 100). Archival practice is the application of theory and methodology.

In 1841, Natalis de Wailly introduced the legal requirement of *respects des fonds*, according to which all the records of one creator had to be kept separate from those of other creators and in the same order in which they had been last used by the creator or its legitimate successor. In 1898, the *Manual of Arrangement and Description of Archives*, written by Muller, Feith and Fruin refer to this methodology as the principles of provenance and original order "The principles of archival arrangement were based on the assumption that keeping the records of a given records creator together and in their original order were the best means to preserve the trustworthiness that attached to records through the circumstances of their creation, maintenance and custody" (MacNeil 2011, 178).

The early writings of Sir Hilary Jenkinson discuss the principle of unbroken legitimate custody, which guides archival methods of preservation aimed at protecting the integrity of the records (Jenkinson 1922, 1965). The expression unbroken legitimate custody refers to a succession of trusted custodians that are responsible for the physical and moral defence of the records throughout their lifecycle, maintaining their context, stability and endurance over time (Jenkinson 1922). A trusted custodian is a legal person who has no reason to alter the records, or to allow others to alter them, and is capable of meeting the requirements for maintaining and preserving authentic records (Duranti and Preston 2008, 229). The ability to demonstrate legitimate unbroken custody provides the records with trustworthiness. An interruption in the control over the records offers the opportunity for deletion, alteration or substitution and, if custody is discontinued or cannot be proven to be legitimate and unbroken, it may be impossible to demonstrate that records have not been altered (Duranti 2005).

Changes to record-making and recordkeeping brought about in the Twentieth Century by the emergence of the digital environment and the recognition that storage, retrieval and presentation processes of records created and maintained in such environments introduces physical and representational transformations, required a re-examination of the traditional principle of unbroken custody. A product of the research conducted by the InterPARES Project (1998-2001) was an expansion of the traditional principle of unbroken custody to be interpreted as an unbroken chain of preservation (Duranti 2005, 304). This interpretation allows for activities and technologies capable of managing records throughout their existence, linked together as in a chain, thereby establishing and protecting the identity and integrity of records from creation to preservation through controlled technological change (Duranti 2005). It also signaled a paradigm shift in archival practice and the role of the archivist, "from custodial care post-hoc to anticipatory approaches to preservation in order to provide some assurance that the records coming into archival custody, and even those that are not, can be trusted to some degree" (MacNeil 2011, 183).

In archival diplomatics, a digital record is *trustworthy* if it is simultaneously reliable, accurate, and authentic (Duranti 2009, 52 & 53). The relationships between the concepts of reliability, accuracy and authenticity are demonstrated in Figure 1 – Archival Trustworthiness (see below).

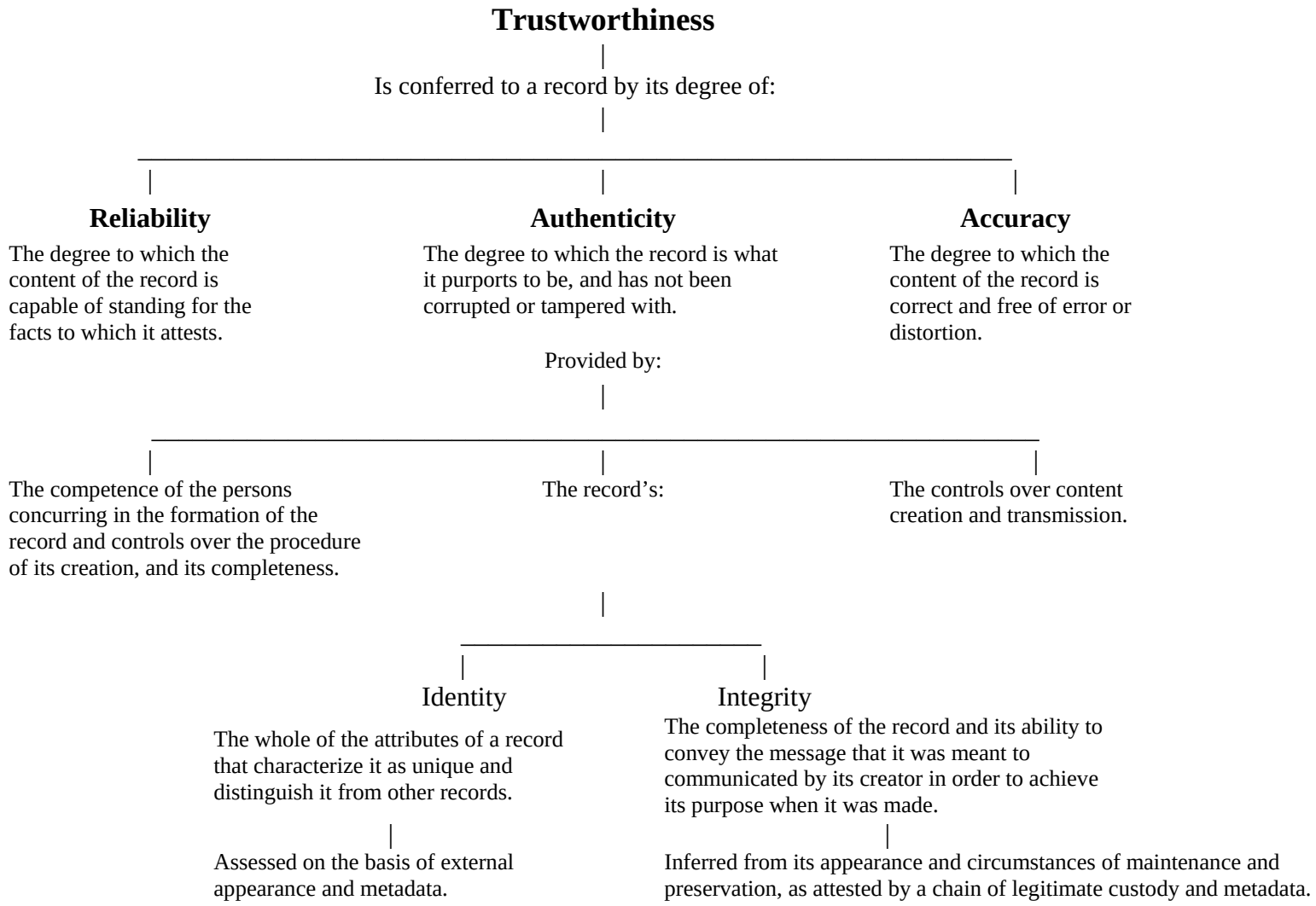

Figure 1 – Archival Trustworthiness

Reliability as a quality of trustworthiness refers to the digital record as a statement of fact, as to content, and is the responsibility of the author, who is the person or organization that has the authority and competence to make the photograph (e.g., photographer, news media outlet, law enforcement, etc.).[2]

Accuracy as a quality of trustworthiness refers to the correctness of the data within a digital record. The accuracy of digital image data (e.g., colour space, size) is vulnerable to changes during transmission across systems (e.g., into and out of social media platforms) and through time (e.g., social media platform upgrades and migration of social media content by the provider). Responsibility for the accuracy of a digital photograph moves from the author to the preserver over time.

Authenticity as a quality of trustworthiness refers to the record as a record, defined as the fact that the record has not been intentionally or unintentionally altered or corrupted. An authentic digital photograph maintains the same identity it had when first generated, and can be proven to have maintained its integrity over time. The identity of a digital photograph is the whole of the attributes that distinguish it from any other digital photograph, and is assessed on the basis of its external appearance and its metadata. The integrity of a digital photograph refers to its ability to convey the same message it was intended to communicate when generated. It is inferred from its appearance and the circumstances of its maintenance and preservation, as attested by

[2] The author is the physical or juridical person having the authority and capacity to make the photograph, commonly referred to as the photographer. On the other hand, the creator is the physical or juridical person who is responsible for the creation and receipt of all the records in a single fonds. It is common practice for a photographer to be hired by a government agency or an institution to take photographs. In this instance the agency would be the creator, and the photographer would be the author (Duranti 2005, 204-219).

demonstrable chain of custody and integrity metadata. Archival diplomatics literature refers to identity and integrity metadata captured in a record profile, which is the common terminology stemming from electronic records management systems (ERMS); however, photographers who use image-based management systems (e.g., Adobe Photoshop) would be more familiar with metadata profiles, which contain identity and integrity metadata and are embedded in the digital image file header or linked as a sidecar file (Bushey 2005). A more in-depth explanation of identity and integrity metadata is provided in the subsection 2.2.2.1 of this chapter. Responsibility for the authenticity of a digital photograph moves over time from the recordkeeper, who, in the case of social media photographs, may be the social media service provider simply by default, to a designated preserver, who guarantees ongoing access and long-term preservation.

In the absence of sufficient evidence linked to a digital record, its authenticity can be inferred on the basis of the trustworthiness of the digital system in which the record resides (Duranti 2009, 54 & 55; Chasse 2013). Diplomatics assesses the trustworthiness of a digital records system according to the degree to which the record-making and recordkeeping procedures are standardized according to a set of rules, and by mechanisms to implement these rules. For record-making purposes, the trusted digital system should include integrated business and documentary procedures, which establish ownership of, and responsibility for, records held within the system; record metadata schemas (i.e., lists of identity metadata and integrity metadata); record forms (i.e., specifications of the documentary presentation for the records generated in the system); record-making access privileges (i.e., authority to edit, annotate, read, retrieve, transfer and destroy records in the system); and technological requirements for ensuring

the integrity of the system. For record-keeping purposes, the trusted digital system should include a record-keeping metadata scheme (i.e., list of all metadata required to ensure continuing identity and integrity in the system); a classification scheme linked to a retention schedule; a registration system (i.e., unique identifier); a record-keeping retrieval system and access privileges (i.e., authority to classify, annotate, read, retrieve, transfer and/or destroy records in the system) and procedures for maintaining authentic records. Archival diplomatics considers the role of the recordkeeper as a trusted custodian the key to a presumption of trustworthiness for digital records (Duranti and Preston 2008). Thus, one begins to see that, in the digital environment, the practices and platforms used to share and store digital photographs must capture, manage and preserve the context of creation, use and reuse in order to maintain and preserve record trustworthiness.

2.2.2 Previous Research

2.2.2.1 Archival Diplomatic Analysis of Photographs

Following the publication of Duranti's articles on diplomatics in *Archivaria* (1989-1992), archivists were inspired to use diplomatics as a method of conceptual analysis for critical examination of archival photographs. In total, four articles were written (O'Donnell 1994; Schwartz 1995; Bartlett 1996; Parinet 1996) in which diplomatics was employed to understand the meanings of archival photographs in a manner that traditional archival theory and principles may have overlooked due to the conventional focus on textual records. In each article, archival procedures for managing and preserving both organizational and personal photographs were deemed inadequate to reveal a photograph's status as a record, because they did not present the context of creation, authorial intentions or the multiple meanings associated with different uses

of photographs throughout their lifecycle (O'Donnell 1994; Schwartz 1995; Bartlett 1996; Parinet 1996). Specific criticism was directed at existing archival practices of appraising photographs as artifacts, arranging them as discrete items within thematic collections, and providing descriptions based solely on image content, all of which has limited the understanding of the functional origins of photographs and the relationships among photographs of the same author, creator and/or activity (O'Donnell 1994, 106; Schwartz 1995; 43; Bartlett 1996, 487).

Although the focus of each article differs slightly, the overall theme is the application of archival diplomatic analysis to institutional and personal photographs as a method of establishing that the photograph was a record created (i.e., made or received and kept for further action or reference) by a physical or juridical person in the course of a practical activity as an instrument and by-product of that activity.[3] This is achieved through the identification of a photograph's intrinsic elements (i.e., elements of the photograph that convey the action in which it participates and its immediate context, the persons involved in its creation—author, addressee, writer, creator, and dates of creation, transmission, use); extrinsic elements (i.e., external appearance of the photograph, including annotations and descriptions); and procedures of creation and use. In doing so, these studies provide a foundation for recognizing photographs as records with evidential value (i.e., the capacity of providing information about the origins, functions and activities of their creator) and establish that photographic meaning is contingent upon the circumstances of creation, authorial intentions and multiple uses. "The photograph is neither truth, nor reality, but a representation willed into existence for a purpose and mediated by the

[3] These early studies examine chemical-based photographs; however, Parinet asserts that archivists must "deal with all images on an equal basis, whether they be computer generated or not" (Parinet 1996, 492).

persons concurring in its formation. Its message is embedded in the visual transcription of facts, but emerges only in functional context" (Schwartz 1995, 44).

There are concerns regarding the limitations of archival diplomatics as a singular method of analysis, due to its focus on the item (not the aggregate) and its systematic approach; however, the authors of these studies encourage archivists to adopt a diplomatics "mind-set" and to use it as a critical method of analysis for photographs, in combination with the archival principles of provenance, original order and chain of custody (O'Donnell 1994; Schwartz 1995, 52; Parinet 1996). In regards to archival practice, these articles demonstrate that diplomatics can be an effective tool to enhance archival analysis of photographic archives (Schwartz 1995, 54; Parinet 1996, 485; Bartlett 1996; 487). The limitations of these theoretical approaches are that they do not address digital photography or the online environment.

Subsequent phases of the InterPARES Project, InterPARES 2 and 3 (2002-2012), continued to develop archival diplomatics as a theoretical framework through the investigation of issues associated with the long-term preservation of authentic electronic records resulting from artistic, scientific and government activities. These developments were based on the conclusions of InterPARES 1. In the report published in 2002, "Requirements for Assessing and Maintaining the Authenticity of Electronic Records," the InterPARES Authenticity Task Force asserted that the significant risk of inadvertent or intentional alteration of records in the digital environment meant that records relied upon by the creator during the course of business could no longer be presumed authentic; therefore, in order to support a presumption of authenticity, the preserver would need to obtain evidence that the digital records had been created and maintained by the

creator using technologies and procedures that establish record identity and lay a foundation for demonstrating record integrity (MacNeil 2002, 40). As a result, InterPARES 1 developed and issued a set of criteria entitled, "Benchmark Requirements Supporting the Presumption of Authenticity of Electronic Records," which address the actions that should be taken by creators during the creation, use and maintenance of their digital materials (Duranti 2005, 210-212). InterPARES 1 also produced a set of criteria directed to the preserver, named "Baseline Requirements to Support the Production of Authentic Copies of Electronic Records," which addressed the procedural controls over the transfer of inactive records (i.e., no-longer actively being used by the creator, but designated for long-term preservation) into archival custody and the preservation actions taken by an appointed preserver following transfer (Duranti 2005, 212-214). The baseline and benchmark requirements influenced a later study conducted by Bushey on the authenticity and reliability of digital photographs (2005) and the guidelines developed by InterPARES 2 for creators and preservers (Duranti and Preston 2008).

In 2005, InterPARES 2 conducted a survey of "Recordkeeping Practices of Photographers using Digital Technology" utilizing the archival diplomatic framework (Bushey and Braun 2007).[4] The survey explored how professional photographers create, manage and preserve their digital photographs collections; the photograph's documentary forms; the metadata schema that were used; and the preferred methods for establishing the identity of digital photographs and maintaining it, and for protecting their integrity. At the time of the survey, the photographic industry was replacing chemical-based equipment and materials with digital capture devices and

[4] The Survey Report was completed and submitted internally to InterPARES 2 in July 2005. Subsequently, revisions were made in December 2006 and the report was released to the public September 2007. The final public date will be used throughout this dissertation.

image-processing software and hardware, causing many professional photographers to transform their practices (Ibid, 1). In order to create high-quality digital photographs, professional photographers were investing in expensive hardware and relying on commercially available software to support their emerging professional digital practice (Ibid, 10). The sharing of digital photographs was limited by existing hardware and software, available bandwidth, and professional concerns regarding unauthorized use, which could impact the commercial value of the digital photograph. The most common mode for sharing digital photographs was email (for small files) and file transfer protocol (FTP) software. The most common mode for publishing digital photographs online was personal websites (Ibid, 25).

The InterPARES 2 survey revealed that professional photographers, particularly photojournalists, were aware of technical image metadata schema standards promulgated by the Japan Electronics and Information Technology Industries Association (JEITA) and Camera & Imaging Products Association (CIPA) and descriptive image metadata standards promoted by the International Press Telecommunications Council (IPTC) for the purposes of ensuring interoperability across devices, software and systems, as well as providing and protecting technical and descriptive information about the images (Bushey 2005, 59). Less than half of the respondents had adopted digital asset management (DAM) systems to manage access to their digital photographs collections and allow for the integration of image metadata to assist in organization and retrieval (Bushey and Braun 2007, 25). However, photographers were relying on systemized approaches that stemmed from the physical era, such as file naming and folder hierarchies akin to film sleeves and filing cabinets, to manage their collections of digital photographs (Ibid, 11). As with earlier chemical-based materials, professional photographers

shaped their digital practice according to workflows and available tools that could support quick and accurate access to digital photographs held within expanding collections.

The approaches to storage and preservation of digital photographs collections were also influenced by available hardware and software. At the time, cloud-based services and social media platforms were not yet integrated into photographic practices; therefore, photographers relied on copying digital photographs to compact discs (CD) and digital versatile disks (DVD) for storage as read-only master files and additional copies as back-ups (Ibid, 11). The majority of survey participants had yet to experience any loss or corruption of digital photographs due to media fragility or obsolescence, as digital practice was still relatively new at the time the survey was conducted. Thus, backing-up and refreshing (e.g., copying the content of an older CD onto a newer CD) were the most common strategies for long-term preservation of digital photographs collections (Bushey 2005, 141). The survey findings revealed that digital photographic practice was being shaped by business needs, available technologies and industry standards. The fact that many professional photographers worked independently (e.g., freelance) meant that policies guiding the creation, management and preservation of their digital photographs collections were non-existent or remained tacit knowledge with ad hoc procedures (Bushey and Braun 2007, 16).

The results of the study were incorporated into a University of British Columbia Master's Thesis (Bushey 2005) and reported in an article published in the photography-themed issue of *Archivaria*, the journal of the Association of Canadian Archivists (Bushey 2008). These publications provided the scholarly and professional archival community with the opportunity to gain insight into digital record-keeping practices of professional photographers. As a result, the

archival community was informed of image metadata standards previously unknown, and how organizational and individual workflows shape photographic practice and result in the production of specific image file formats, which have properties (e.g., compression) that may impact long-term preservation.

In her Master's thesis, Bushey conducted an analysis of the findings from the survey of "Recordkeeping Practices of Photographers using Digital Technology" (Bushey and Braun 2007) and used the criteria outlined in the "Benchmark Requirements Supporting the Presumption of Authenticity of Electronic Records" (Duranti 2005) to explore digital image metadata that contribute to establishing the identity of digital photographs and those outlined in the "Baseline Requirements to Support the Production of Authentic Copies of Electronic Records" (Ibid) to explore digital image metadata that contribute to establishing the integrity of digital photographs (Bushey 2005). In digital photographs the identity metadata are embedded in the image file header as *Exchangeable Image File Format* (Exif) and *International Press Telecommunications Council* (IPTC) schema standards (JEITA 2013; IPTC 2015). Exif metadata are automatically captured by an imaging device (e.g., mobile/smartphone) and exchanged (i.e., read and written) with other devices and software that participate in the presentation and production of digital photographs. Exif metadata are mainly technical metadata (e.g., image size, colour space, date and time, etc.) that are embedded in the image file header. IPTC metadata are mainly descriptive metadata (i.e., creator name, subject, source etc.) that are manually captured and embedded in the image file header using imaging or digital asset management (DAM) applications. In a digital photograph, the requirement for identity metadata is fulfilled by Exif and IPTC elements,

whereas the requirement for integrity metadata is only partially fulfilled by IPTC elements embedded in the image file header.

In order to clarify what might constitute supporting evidence for establishing the identity and integrity of a digital photograph, the following lists address identity metadata and integrity metadata in the context of a digital photograph. It should be understood that differing photographic practices will result in more or less metadata, and that requirements for metadata typically reflect both immediate needs and future use, including accountability and evidentiary purposes.

Identity Metadata:

- Names of persons involved in the creation of the digital materials (e.g., photographer, studio, models, client),
- Name of the action or matter (e.g., title, assignment, subject),
- Place (e.g., GPS),
- Documentary form – rules of representation that communicate the content, administrative and documentary context, and authority (e.g., photograph, press-release, portrait or landscape, image resolution, bit-depth and colour space),
- Digital presentation (e.g., JPEG, TIFF),
- Date(s) of creation, use, receipt and storage,
- Expression of documentary context (e.g., subject or classification code),
- Copyright or intellectual rights (e.g., creative commons, copyright restrictions, and licensing),
- Other forms of authentication (e.g., watermarks),
- Version number (e.g., copy, draft, master and camera original), and
- Existence and location of duplicate materials outside of the digital system

Integrity Metadata:

- Name of handling office (e.g., photographer, studio, agency, office and unit),
- Name of office of primary responsibility (if different from above),
- Indications of annotations added to the digital materials (e.g., comments),
- Indication of technical changes to the files or system (e.g., file format migration),
- Access restriction code (e.g., name of persons authorized to read materials),
- Access privileges code (e.g., name of persons authorized to annotate, delete or remove materials from system),
- Vital record code, and
- Planned disposition (e.g., removal from the digital system to storage outside system, or transfer to a trusted custodian).

Bushey's analysis produced recommendations for creators to support the creation, use and maintenance of digital photographs in a manner that would allow for their long-term preservation as reliable and authentic records. In particular the recommendations highlight the role of standardized file formats and metadata schemas to support interoperability and readability over the long term, the importance of capturing and persistently linking metadata related to the identity and integrity of the digital photographs, and the growing need to establish and implement access privileges in recordkeeping systems (Bushey 2005, 107-110).

In 2008, the InterPARES 2 Project released "Creator Guidelines. Making and Maintaining Digital Materials: Guidelines for Individuals" and "Preserver Guidelines. Preserving Digital Records: Guidelines for Organizations," both of which resulted from cumulative research built upon the recommendations put forward in the earlier benchmark and baseline requirements (Duranti and Preston 2008). The creator guidelines are aimed at individuals who create digital materials in the course of their professional and personal activities and intend to refer to or reuse

them as evidence of previous activities and events (Ibid, 722). The guidelines can be applied to the creation of reliable digital materials in general, such as digital publications (i.e., a document intended for dissemination or distribution to the public at large), but are especially focused on ensuring that digital records (i.e., documents made or received as a by-product of activity and saved for further action or reference) can be accurately and authentically maintained and preserved over time (Ibid, 723). The preserver guidelines are aimed at trusted preservers who are responsible for the long-term preservation of digital records (Ibid, 734).

The selected articles and studies demonstrate that archival diplomatics can assist archivists in identifying the persons, contexts and instruments behind photographic creation, and contribute to a more informed understanding of how photographs are made, their different uses and the circumstances of their management and preservation. The archival diplomatic framework establishes that the trustworthiness of photographic records is determined by their reliability, accuracy and authenticity (itself comprised of identity and integrity). As noted, the limitations of earlier approaches are that they do not address specific digital photographic practices involving mobile/smartphones and social media platforms, which introduce a new combination of software, hardware and exchange protocols, as well as new roles and responsibilities regarding creation, management and stewardship of networked personal collections.

2.2.2.2 Visual Literacy and Archival Photographs

Within the archival literature on photographic records the previously discussed articles and studies explore a particular theoretical approach to analyzing photographs, one aimed at establishing and maintaining trustworthiness. A significant and closely related theme in the

archival literature on photographic records is visual literacy, which refers to the ability to understand, interpret and convey the meaning of archival photographs to future users (Schwartz 2002; Schlak 2008; Conway and Punzalan 2011).

In 1976, archivists began discussing the growing interest of historians to include archival photographs among the sources of their research; however, the use that historians were making of primary visual sources placed the images as subordinate to the text or, in cases where archival photographs on the topic were scarce, out of context, by inaccurately captioning the images (Robertson 1976, 42). In "More than Meets the Eye," Robertson discusses how photographers may manipulate images during the process of creation (e.g., re-enactments) and production (e.g., cropping and captioning) and cautions archivists not to assume that an old photograph is an objective document of what it represents. He encourages archivists to investigate the individuals and processes that have brought photographs into existence and communicate the results to the researchers in order to provide the context surrounding the photograph and inform a deeper understanding of the image content. In doing so, Robertson highlighted the need for archivists to exercise visual literacy in their approach to archival arrangement and description, and sparked the interest of archivists in exploring the question: "for what purpose was the [photographic] record created, when, by whom, and in what context" (Scott 1976, 120). As a result of these questions, the first of two photography-themed issues of *Archivaria* was published in 1977. The articles in that first issue reveal an archival awareness of photographs as different from textual records and the need for archival approaches to go beyond simple description of image content and material type in order to discover and convey the multiple meanings inherent in the

photographic records. “Because the photograph is taken for granted or viewed in simplistic terms, it is often interpreted with little consideration for accuracy, authenticity or quality beyond technical aspects. The archivist must protect the photograph from such misrepresentation and distortion by the user in whatever ways possible” (Huyda 1977, 12).

In 1996, the article entitled, “Mind and Sight: Visual Literacy and the Archivist,” by Kaplan and Mifflin, provided a basic framework for visual literacy that is dependent on both the informational content of the image and the context of its creation and use. Kaplan and Miffling introduced three levels of visual awareness: the superficial contents of the image, the concrete subject matter, and the abstract elements (Ibid, 111-12). In the first level, the archivist observes the image content, which is sometimes referred to as the photograph’s “of-ness.” In the second level, the archivist uses contextual knowledge about the people in the image, related events, political and economic trends etc. to understand the photograph, which is sometimes referred to as the photograph’s “about-ness.” In the third level, the archivist interprets the meaning of the photograph based on what is known about the author’s intentions, the genre or style, and characteristics of the photograph in isolation and within the aggregate, such as point-of-view, sequence and organization. It is through this process that archivists can interpret the meaning(s) of photographs and communicate them to their patrons (e.g., researchers, historians). The work of Kaplan and Mifflin has become a cornerstone for visual literacy in the archival community and their original article has been reprinted several times between 1996 and 2000.

In 2006, the Society of American Archivists published *Photographs: Archival Care and Management*, which included an entire chapter on "Reading and Researching Photographs," and stressed that: "basic visual literacy, the ability to 'read' pictorial images, is a fundamental skill necessary for working with photographs" (Vogt-O'Connor, Zinkham and Ritzenthaler 2006, 59). The widespread use of digital photography by organizations and individuals, along with the prevalence of digitization activities in cultural heritage institutions had contributed to the need for archivists to develop their visual literacy skills (Sassoon 1998, 2004; Conway and Punzalan 2011). In the second photography-themed issue of *Archivaria* (2008), editor Sarah Stacy observed that many of the early challenges posed by photographic records to archivists were still relevant; however, the transformation of photography and photographic practice by digital technology had been profound. The increasing centrality of the digital environment for both creators and preservers resulted in a shift from visual literacy to digital visual literacy, which reflects on the meaning of visual media in different formats. As Stacy points out, "[d]igital photography…has changed how images are used: taken in massive quantities, and able to be circulated and viewed without ever necessarily becoming something held in the hand" (Ibid, 2).

Archivists, Conway and Punzalan have responded to the challenge by conducting exploratory studies, which draw upon semiotics to assess end-user "judgements" about the quality, integrity and value of digitized photographs held in online image libraries, specifically the Library of Congress's American Memory collection (Conway 2008, 2009a, 2009b, 2010; Conway and Punzalan 2011). Their findings show that archivists need to continually explore visual literacy in light of evolving technologies and socio-cultural practices related to photography. "Visual

literacy remains a problematic concept for archival thought. Its meaning is constantly redefined and its terms are renegotiated as media formats and notions of visual competencies evolve" (Conway and Punzalan 2011, 72). The authors propose a new approach to understanding the meanings of historical photographs, one that is derived from the experience of users during the activities of discovery and interaction with digitized archival photographs. Conway and Punzalan situate their research within the emerging field of digital visual literacy, which attempts "to reconcile new technologies of visual remediation with traditional forms of interpretation conducted with the photographic item in hand" (Ibid, 66). They recognize that archivists working with photographs have promoted visual literacy as a framework in which the inadequacy of traditional archival practices can be addressed. A key finding of their research is that digitized surrogates of archival photographs introduce new interpretations and new levels of visual meaning (Ibid, 96). This leads the authors to suggest that archival practice, specifically the interpretation of archival photographs, should be co-established with the users of archives (Ibid, 97).

Considering the abundance of photographic materials from the 1900s in the holdings of archival institutions, concerns about the visual literacy skills of cultural heritage professionals are well founded. Unlike textual records, which are composed of words that "tell," photographs communicate their meaning through images that "show." Although the images presented in photographs may seem transparent and self-evident, they require explanation, especially when the person, place or thing represented is distanced in time from our immediate experience (Mitchell 2002). The selected literature and studies reveal the evolution of visual literacy in

response to digital technologies for creating and sharing photographs. As cultural heritage institutions move forward with digitization activities and acquire born-digital image collections, visual literacy skills will be required in order to understand photographic representations and effectively communicate their plurality of meanings to researchers and the general public.

2.2.2.3 Curation of Online Photographs Collections

As individuals and organizations increasingly conduct their leisure and business activities in the online environment, particularly through social media platforms, cultural heritage professionals are turning their attention to the additional opportunities and challenges presented by the networked image to contemporary record-making and recordkeeping practices. The Digital Lives Research Project (2007-2010), led by the U.K. British Library in partnership with University College London and the University of Bristol, explores the theoretical and practical aspects of curating personal digital objects (i.e., manuscripts, images, videos etc.) over the entire archival life cycle (i.e., creation through preservation) and their findings suggest that the widespread adoption of social media platforms for sharing and storing personal digital collections designates it as an area for potential collaboration between archival institutions (mandated to preserve public and private records) and social media providers in an effort to offer services that support the long-term preservation of authentic online content (John et al. 2010).

To this end, a team of media archivists and academics involved in activities that support the preservation of digital photographs and videos created by individuals and shared through social media platforms has undertaken the Activist Archivist Project <http:/activist-archivists.org/wp/> (2011 – ongoing). The impetus for this project was the 2011 Occupy Wall Street Movement

(OWS), in the course of which participants used social media platforms to organize events and disseminate visual documentation of OWS demonstrations. Both the Activist Archivist Project and the Digital Lives Project highlight the influence of smartphones, cloud computing infrastructure and Web 2.0 services on personal recordkeeping activities (or lack thereof). At the outset, the Activist Archivist Project began exploring how to collect and preserve the digital visual media being generated by the Occupy movement, which was user-contributed content distributed throughout the Internet on social media platforms. Their approach involved archivists actively collecting digital photographs and videos from social media platforms and providing guidance to creators through best practices and collaborative outreach projects such as the "Why Archive?" card (Activist Archivists). Ultimately, the volume and broad dissemination of Occupy materials throughout the online environment, along with the Movement's participants' desire to control their own archives and apprehension at granting control of the archives to an institutional entity (i.e., Taimiment Library at New York University) made it difficult to determine an appropriate archival appraisal and selection strategy (Besser 2013). In light of the suggestion put forward by the Digital Lives report, that future collaborations between social media platform providers and archival repositories may offer services capable of supporting the long-term preservation of personal digital archives distributed across the online and offline environment, one of the key lessons learned by the Activist Archivists was that the culture of an organization has a direct impact on the quality of the digital materials created and the degree of trust placed in institutional and/or corporate entities to preserve and provide access to special-interest groups' digital archives (John et al. 2010, xiii; Besser 2014).

In April 2010, the Library of Congress and Twitter (a micro-blogging platform that allows authors to post 140-character messages, a.k.a. “tweets,” to their network of followers) signed an agreement providing the Library with all public tweets from 2006 - 2010 as a collection to be managed and preserved by the Library (Library of Congress 2013). In February 2011, the Library of Congress began receiving transfers of tweets dated 2010 – onward. At the time of writing, the Twitter archives at the Library of Congress had yet to be made available to public researchers. However, it has the potential to provide an opportunity for archivists and cultural heritage professionals to explore issues of privacy, ownership, reuse and persistence of social media content in the context of collaboration between a social media service provider and a publicly funded cultural institution (Small et al. 2012). Furthermore, collaboration between the Library of Congress and Twitter may ignite debate regarding the value of preserving social media content for different stakeholders, such as the original creators, data curation professionals and the general public, of preserving social media content. A number of recent studies conducted by personal information management (PIM) and human computer interaction (HCI) scholars associated with Microsoft Research explore the permanent value of social media platforms beyond their immediate communicative function, as well as users’ expectations of ownership and control over co-created social media content (Marshall and Shipman 2014, 2015; Lindley et al. 2013; Odom et al. 2012). Lindley et al. and Marshall and Shipman define two approaches: the PIM perspective, which is focused on how social media content “may be managed in the context of daily activities,” and a personal archiving perspective, which is “focused on content that might be kept over time, abstracted from its immediate use” (Lindley et al. 2013, 750). They argue that, despite findings revealing a lack of support from current users regarding institutional efforts to preserve user-generated social media content (especially in the case of photographs), holdings of

social media platforms should be considered as valuable resources for data curation and future research (Marshall and Shipman 2014, 16). This leads the Marshall and Shipman to suggest that further research is needed to determine what kind of institution would be sufficiently trusted and competent to oversee the stewardship of collections of social media content (Ibid, 19).

The Library of Congress's Twitter collection, findings of the Activist Archivists' project to collect and preserve user-generated content from the Occupy Wall Street Movement, and the scenarios explored through PIM and HCI studies highlight the shifting roles and responsibilities for ensuring ongoing access to and preservation of user-generated content stored in social media platforms as primary sources. They also reveal how new forms of personal communication are increasingly public (i.e., published to social media communities and the larger online audience) and reliant on proprietary software to convey functional context and establish the authorial intentions and multiple uses, factors which potentially remove creator control over user-generated materials and introduce the opportunity for others (e.g., individuals, institutions, corporations etc.) to reuse personal digital archives for their own purposes, including monetization of social media photographs by licensing them to third-party advertisers. Personal digital collections held in social media platforms are technologically under the control of corporations such as Facebook, and determining legal control requires navigating complex Terms of Service agreements, which all users are required to agree to, prior to using the online service (Besser 2014).

Sharing content on social media platforms also encourages activities of commenting and collaboration that may result in co-creation between users and potentially the service provider

(e.g., interface features that are unique to the social media platform), and this further complicates legal ownership and future attempts to remove a single creator's content from the online system for the purposes of preservation. In Acker and Brubaker's study on practices of bereavement in social media platforms, the authors emphasize the impact of platforms on the creation of personal digital collections, and future access and use of these digital materials (2014). They propose a figurative definition of platform, one that "signifies the confluence of networked services and user-generated content" and refers to the privileging of "certain types of use with particular ends" (Ibid, 7). They observe how sharing practices through social media platforms result in accumulations of content that acquire new layers of context as other social media members contribute and reuse personal collections. These practices blur "boundaries of ownership, access and governance over personal archives" stored in social media platforms (Ibid, 7). A 2015 study of funerary practices and Instagram use contributes to the work of Acker and Brubaker by revealing how each social media platform presents a unique style, grammar and logic, which influences the "collective cultural practices that operate on and through it" (Gibbs et al. 2014, 258). The authors attribute the emergence of Instagram and its particular genre of visual communication to the availability of mobile phones with cameras and connectivity to social networking services. Recognizing the historical relationship between photography and memorialization, the authors assert that contemporary photographic practices are evolving in response to the network affordance of Instagram, which results in a transformation of previously private photographic contexts into increasingly public and collective context.

By focusing on the platform, Acker and Brubaker and Gibbs et al. emphasize the growing importance of the interaction between networked services and content creators in determining

how digital photographs are created, shared, stored, accessed and reused. By gaining a better understanding of how social media platforms privilege and cultivate specific types of visual communications, archivists can determine the feasibility of preserving the context of personal archives in networked environments that have no assurance of persistence and, if necessary, explore new models of stewardship that may or may not involve collaboration with social media service providers.

2.3 Photography

2.3.1 Theoretical Foundations

Archivists' understanding and treatment of photographic records are informed by archival theory and principles, and influenced by photography theory and criticism, that is, by the system of ideas that explore and "explain" photography. Since photography's inception in the early 1800s, there have been several theoretical approaches to photography that stem from different disciplinary perspectives, including semiology, psychoanalysis and sociology. These perspectives address various aspects of photography, such as the nature of photography, how photographic meaning is constructed, the technology of photography, the material object itself, and the social and cultural role of photography. It has been suggested that photography theory is neither an autonomous discipline, nor does it produce a methodology dependent upon it. Instead, it is an interdisciplinary exploration of "complex theoretical questions about representation: signs and objects, narratives and events, life and politics" (Emerling 2012, 1).

The following subsection highlights early photography theory and criticism that explore the ontology of photography and how photographs acquire meaning. Central to these early works is

the relationship between the photographic image and reality, and the function of photographs as empirical proof of that which existed in front of the camera lens. Ideas associating photographic representation with truthful depictions of reality are situated within the larger philosophical beliefs of modernism, which prevailed in Europe in the 1800s, presupposing reality as a given, external entity that is available for objective recording by the camera, through which accurate references are produced in the form of photographs. Many of the seminal ideas disseminated in the late 1800s and early 1900s continue to influence public notions of archival photographs as unmediated representations of past events, persons and places. Thus it is important to revisit these theories in order to discuss their evolution in the context of archival approaches to arranging and describing photographs, including future approaches to managing and preserving social media photographs as trustworthy records.

2.3.1.1 Chemical Photography

In 1827, the chemical process of capturing daylight reflected off an object and fixing it to a mirror-polished metal plate covered with light sensitive emulsion resulted in a photographic image. This process was refined and released to the world as the daguerreotype (named after the inventor of the process, Louis Daguerre). It is a direct, singular process, which creates a reverse image on a plate that appears as a positive, due to the mirrored surface, and cannot be duplicated. In the following decade, Henry Fox Talbot invented the calotype process, which involves fixing a reverse image onto paper and then placing the negative against another coated sheet of paper to produce a positive image. This two-step process creates a positive image on paper that can be duplicated. In *The Pencil of Nature* (1844), Henry Fox Talbot introduced the calotype process as "the mere action of Light upon sensitive paper…formed or depicted by optical and chemical

means alone, and without the aid of any one acquainted with the art of drawing" (Ibid, 5). He then described his process of discovery and presented a collection of calotypes accompanied by a discussion of the techniques used, variables affecting exposure and the range of objects that can be reproduced photographically. Talbot explained his experimentation with different chemicals and materials, reporting on both his failures and successes. In this manner, scientific practice and observation were seen as contributing to the invention of the calotype process, aligning photography with empirical evidence and influencing its future applications (Tucker 2005).

In *The Pencil of Nature* "Plate III: Articles of China," Talbot presented a scenario to the reader, in which a thief steals precious China from a cabinet, yet a prior photograph of the China existed, providing visual proof of the existence of the stolen object. He raised the question of what would happen "…if the mute testimony of the picture were to be produced against him [the thief] in court – it would certainly be evidence of a novel kind" (Talbot 1844, 34). In doing so, Talbot made a correlation between the photographic image and visual proof based on the authority of nature, the materiality of the optical and chemical process, and the objectivity of the mechanical apparatus and reproduction. Yet, he also invited speculation "…what the judge and jury might say to it" (Ibid, 34). In the decade following the publication of *The Pencil of Nature*, photography spread throughout Europe, the United States and Australia, bringing with it the establishment of photographic clubs (e.g., Royal Photographic Society) and publications aimed at cultivating interest in photography and sustaining photographers through practical and artistic instruction (Batchen 2001, 6; Tucker 2005). Improvements in photographic processes, and the development of popular formats (e.g., cartes de visite) quickly transformed photographic practice from an "art-science" activity performed by genteel middle-class amateurs to a popular trade

(Tucker 2005, 22). The wider usage and application of photography, particularly in legal courts as the basis of identification of individuals, introduced the opportunity to debate "…the trustworthiness of photography" and explore the relationship between the object in front of the lens and the subject presented in the photographic print (Photographic News 1873, 396 quoted in Tucker 2005, 65).

In 1897, philosopher and natural scientist, Charles Sanders Peirce published the first of many essays on semiotics, in which he explored the concept of the sign (i.e., something which stands for something) and its object (i.e., what the sign stands for) in an effort to identify the system from which meanings are construed (Peirce 1897, 2.227-9 included in 1955, 99). In his essay "What is a Sign?" (1897) Peirce presented a typology of signs based on their relationship to the object they signify as: iconic (i.e., based upon resemblance to that represented), indexical (i.e., based upon an indicator or physical trace from the object that modifies it), and symbolic (i.e., based upon association of general ideas) (Buchler 1955, 102; Wells 2010, 46). In the application of Peirce's sign-system to photography, the relationship between the photograph and the object in front of the lens was categorized as indexical, due to the physical causality between the light reflecting off the object in front of the camera and the point-by-point likeness depicted in the photographic image. "A photograph… not only excites an image, has an appearance, but owing to its optical connection with the object is evidence that the appearance corresponds to reality" (Collected Papers of Peirce 1931, 58 quoted in Chandler 2014). For both Peirce and Talbot, the photograph was different from other forms of pictorial representation, due to the optical and chemical laws that governed its production (Newhall 1938, 41). The belief in the photograph as

an index persisted throughout early photography theory and criticism due in part to historical investment in the idea that the physical photograph had a chemically fixed and mechanically guaranteed link to what it depicted (Lister 2011, 316). The indexical quality of photography became a topic of debate once again with the advent of digital photography. On the one hand, photography theorists argued that digital photographs could be indexes due to the photosensitive cells of a digital camera (i.e., indexical registration); and on the other hand, they argued that digital photographs could not be indexes due to the possibility that the image content was not representative of concrete things that existed in a specific time and place (Ibid, 318).

From Benjamin to Sontag, early theories of photographic representation were founded on the belief that "[t]he camera records, within certain limits, whatever is focused on the ground glass" and "if we had been there, we could have seen it exactly so" (Newhall 1938, 50; Sontag 1973). As a result, despite knowledge of misrepresentation, distortion and fakery, "implicit faith in the truth of a photographic record" and "the authenticity of photographs" remained, and provided the foundation for "documentary-style" photography, which was used in news reportage and social realism (e.g., U.S. Farm Security Administration Project) to provide visual evidence of specific events, people and places (Newhall 1938, 51). It is this confidence in the truthfulness of a photograph that contributed to its acceptance as a trustworthy record (Iacovino 2006, 41).

In his essays "Little History of Photography" (1931) and "The Work of Art in the Age of Its Technical Reproducibility" (1935-39) Benjamin explored the concepts of *authenticity* and *aura*

in the context of art. Benjamin wrote about the role of photography as an art form and the changes brought about by mechanical reproduction (i.e., mass duplication of photographic prints and their global distribution) to both photography and art in general. In discussing early portrait photography, Benjamin observed that the daguerreotype process (a singular positive image without possibility of duplication) involved long exposure times, which required the sitter to remain still for such a lengthy period that special devices and props were needed to support the human body and keep it static throughout the duration of exposing light to the sensitized emulsion on the silver plate. He claimed that the duration of the event cultivates a specific internal intensity in the subject, a presence that "grew as it were into the picture" and infuses the photograph with a sense of permanence (Benjamin [1931] 1972, 17). As a result of the subject's engagement, and the physical materiality and boundaries, the daguerreotypes, "had an aura about them, a medium which mingled with their manner of looking and gave them a plenitude and security" (Benjamin [1931] 1972, 18). For Benjamin, the aura was an effect of a work of art that is uniquely present in time and space, the "here and now" (Benjamin [1931] 1972, 7). The experience of the aura is "…the unique manifestation of a distance, however near it may be" (Benjamin [1931] 1972, 20). This is a figurative distance between the work of art and the viewer, one that is rooted in the authority claimed for the work on the basis of its position within a tradition of art, and prior to that, in the service of ritual.

Unlike the calotype and later photographic processes that provided for the mass duplication and wide dissemination of copies, daguerreotypes were singular art objects that could not be copied. Benjamin equated originality with the art object's unique existence, which bears the marks of

history to which the work has been subject. Ownership is traced through the location of the original, and changes are reflected in the photograph's movement as it is exchanged from one owner to another. The physical medium bears witness to the effects of time, which can be identified through chemical reactions and material changes. The here and now of the original work of art underlie Benjamin's concept of authenticity, which he defined as "…the quintessence of all that is transmissible in it from its origin on, ranging from its physical duration to the historical testimony relating to it" (Benjamin [1936] 2008, 22). Thus, as the link between the art object and its origin is destroyed through mechanical reproducibility, the photograph's unique existence is replaced by a plurality devoid of the capacity to act as historical testimony. Benjamin celebrated the loss of aura, authority and authenticity in modern photography, properties he associated with ideologies of control such as fascism, and embraced the epistemological and political potentialities of new media forms (Jennings 2008, 15). Although Benjamin was writing about the differences between unique artworks that cannot be duplicated and reproducible photographs, his arguments were revisited at the end of the twentieth century in light of the digital turn in photographic practice when similar comparisons were drawn between film-based photographs that rely on an original for high-quality reproductions and pixel-based photographs that presented the potential for limitless reproduction of copies from copies with no loss in quality.

In the 1980 publication *Camera Lucida,* Barthes used semiotics and phenomenology as a lens through which he recognized the power of particular photographs to suggest "a meaning – a different meaning from the literal one" (Barthes 1981, 38). Barthes introduced a system of

photographic representation that is constituted by the *studium*, which represents a general or shared interest in the image content, and the *punctum*, which is a quality of the photograph, often an element that stands out from the image and grabs the spectator/viewer's attention (Ibid, 41). The punctum is discovered by the spectator and is based on the spectator's own interests and concerns. However, the interplay between the *studium* and the *punctum* fails to reveal the essential meaning of photography for Barthes, that which he called the *noeme*. In *Camera Lucida*, he proceeded to discuss photographs of his recently deceased mother in the context of his own biography. This process led him to discover what he determined to be the definitive characteristic of photography, the historical moment of "that-has-been" (Ibid, 77). "[I]n Photography I can never deny that *the thing has been there*. There is the superimposition here: of reality and of the past. And since this constraint exists only for Photography, we must consider it, by reduction, as the very essence, the *noeme* of photography" (Ibid, 76).

Barthes asserted that, unlike other systems of representation, the photographic referent is "the *necessarily* real thing which has been placed before the lens, without which there would be no photograph" (Ibid, 76). These ideas recall the indexical relationship drawn by Peirce between a sign and its object; however, Barthes asserted that the photograph is an image without a code (Ibid 88). He claimed that the truth of the image resides in the reality of its origin – in the existence of the object and not in the meaning of the object (Ibid 87). The photograph's power of authentication, which means that the image acts as a "certificate of presence" because it is always backwards looking, outweighs its power of representation (Ibid, 89). The photograph presents a reality that is always a past moment, but is linked to the present through the viewer's

experience of looking at it. Both Benjamin and Barthes identified the confrontation of the present with the past as an indispensable dialectic bound to the photographic image and essential to interpreting its meaning. “The Photograph then becomes a bizarre *medium*, a new form of hallucination: false on the level of perception, true on the level of time…” (Ibid, 115).

Inspired by photography’s ongoing association with visual evidence, cultural theorist John Tagg explored the history of photography and visual culture in the context of intersections of power. In 1982, Tagg contributed the essay “The Currency of the Photograph” to *Thinking Photography* (1982), an anthology edited by Victor Burgin, which provided a materialist analysis of photography (i.e., drawing attention to the processes being employed by modern power structures to disseminate ideology through photography). Tagg asserted that analysis of photography should involve the complex conditions, means and processes of its production, as well as the mode of its reception (Tagg 1982, 113). He recognized that not all photographs possess a *binding quality*, that is, the status of witnesses to past events – only photographs produced and received within the context of specific institutional contexts, such as government agencies, law enforcement and law courts do so. In a later article, Tagg included the archival component (i.e., archival institutions and archival practices) as part of the political apparatus controlling the production and reception of photography, and contributing to photography’s associations with truth (Tagg 2012, 26). His ideas were influenced by Michel Foucault’s concept of “régime of truth,” in which truth in a society is defined and created by a system of procedures that produce and disseminate statements (both true and false) and are bound in a circular relation to the systems of power that produce and sustain it – inducing and redirecting the effects of

power (Tagg 1982, 129; Foucault [1976] 1977, 14). He shifted earlier notions of authority and proof from the photograph itself to the institutional and corporate infrastructures, which employ photography to communicate their ideology. “This is not the power of the camera but the power of the apparatuses of the local state which deploy it and guarantee the authority of the images it constructs to stand as evidence or register as truth” (Tagg 1993, 246).

Tagg suggested that archival methods of managing photographic records regulate the relationships of time, truth and memory, thereby placing the archives at the centre of notions and practices of political identity and collective memory (Tagg 2012, 33). Furthermore, he reflected on the archival turn in recent scholarship, an interest in the concept of the “archive” (i.e., texts, photographs, repositories and cultural phenomenon) and the way that knowledge is produced and legitimized, suggesting that this provides an opportunity to explore the archival apparatus as both a “frame of knowledge production” and an “object of knowledge” (Ibid, 34).

2.3.1.2 Digital Photography

In the early 1990s, discussions about the ontology of photography, visual representation and photographic processes shifted in response to emerging digital imaging technologies. A key theme in the literature became the concern for the trustworthiness of digital photography, due to its independence from a concrete referent in the physical world for its image content, its capacity for seamless manipulation and its vulnerability to alteration and corruption (Ritchin 1991; Mitchell 1994). Instead of comparing photography to painting or cinema, the debates contrasted film-based photography with computer-based imaging, mainly focusing on the relationship of the image to reality; the importance of interpretation to convey meaning; and the contexts of creation

and use of photography as its truth-value (Wells 2010, 25). The lack of a direct referent in the process of creating digital images, along with the loss of an original negative to analyze and contrast with photographic prints for evidence of changes, prompted new methods of evaluating the trustworthiness of digital photography, which involved assessing reliability through the authority of the provider and the accuracy of the process; and assessing authenticity through the provenance of the image, its date and time of transmission, and its chain of custody (Mitchell 1994, 31).

Theoretical discussions about digital photography began to focus more on the uses of photography as determining its meanings, an approach that was not unique to the digital era, but gained significant momentum as traditional photographic processes and materials were replaced by digital processes and bit streams (Sekula 1982, 94; Tagg 1993; Batchen 1994; Manovich 1996). With the spread of the World Wide Web and the convergence of digital cameras with mobile phones, arguments based on specific media were replaced by explorations into the networked image and activities of sharing and reuse (Lister 2013). At this point, the domain of photography theory merged with ideas and concepts arising out of studies in new media, visual communications and digital culture. The flow of digital photographs through devices, across networks and on screens of all sizes challenges existing theories concerned with the photograph as an object that is distinct from other forms of communication. In this context, relevance is placed on the processes that reproduce and distribute digital images; in particular the algorithmic operations of software and its influence on how digital images are written and re-written (Manovich 2012; Gómez Cruz and Meyer 2012; Rubinstein and Sluis 2013; Rubinstein 2015).

These technological changes are being explored along with evolving socio-cultural practices of image making and sharing. Although photography as a medium has been supplanted by the digital data flowing across screens, the cultural practice of taking and sharing photographs, especially personal photography, is more popular than ever before. The rise of social media services and the various types of platforms for sharing user-generated content are transforming photography into an immersive economy, one that provides individuals with substantial tools for production and platforms for dissemination (Rubinstein 2015). The reach of social media communities and the potential for personal photographs to be reused in any number of commercial applications, along with their implications for social memory, need to be considered by both creators and preservers. “In photography’s digital afterlife, everyone is an image-maker, but also, potentially, a publisher and archivist” (McQuire 2013, 224).

2.3.2 Previous Research

Current research by interdisciplinary scholars interested in photography and new media, visual communications and cultural studies, confirms that the cultural conventions of film-based photography persist and shape the reception and use of digital image-making technologies, whereas other aspects have been completely transformed into very different socio-technical practices (Mitchell 1992; Hand 2012, 142). The interplay between technology and social and cultural factors has become an area of interest for scholars exploring digital photography as a form of visual communication influencing social memory, as well as the role of social media platforms as repositories for visual culture (Pauwels 2008, 35; Sturken 2008). The research discussed in the following subsection focuses on personal digital image-making practices that utilize cameras and more often, mobile devices with built-in cameras.

2.3.2.1 Personal Digital Photography[5]

Personal photography is defined as: "that which is done by non-professionals for themselves and their friends and intimates" (Van House 2011, 125). Scholars conducting research on personal photography are not concerned with issues of reliability, accuracy and authenticity. In fact, manipulations of personal digital photographs are treated as "deliberate acts of self-deception," as opposed to acts that alter or destroy the photograph's trustworthiness (Pauwels 2008, 36). The selected studies explore the ways that technology and social practices are introducing new methods of creating, sharing and storing photographs, many of which blur the boundaries between personal and public lives (Van House and Churchill 2008; Hand 2012).

Historically, personal photography as a social practice developed in the late nineteenth century, following in the wake of institutional and commercial applications of photography. The personal photograph was used predominantly as an aid to memory – images of loved ones and family members were represented and kept as keepsakes. The presentation of personal photography typically involved framing photographs and hanging them in the home, or gathering collections of photographs and mounting them to pages in a bound album. Personal photographs were rarely viewed outside of the home and were considered to be private, precious objects.

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[5] The material in this section draws on the author's previously published article: Jessica Bushey, "Convergence, Connectivity, Performance and the Ephemeral: New Characteristics of Digital Photographs," *Archives & Manuscripts* 42, no.1 (2014): 33-47. Reprinted with permission of the publisher. Routledge, Taylor & Francis Group, http://www.tandfonline.com/.

The growth of the photography industry in the twentieth century provided services and cameras aimed at supporting the amateur photographer, and by 1970, the majority of American and European households owned at least one camera (van Dijck 2011). Culture and media theorists Rubinstein and Sluis make the observation that the initial adoption of digital photography by amateur photographers in the 1990s was limited by a number of factors including the cost of digital cameras, the lack of convenient methods for sharing digital images, and the complexity and cost of publishing images on personal websites (Rubinstein and Sluis 2008, 12). Furthermore, it was not until digital cameras became affordable, viewing technologies improved (in-camera and through external devices), image storage expanded, and transmission across telecommunications networks became available and reliable that personal digital photography gained widespread use. Rubinstein and Sluis suggest that "[t]he disappearance of the camera inside the telephone bonded photography to the most important device of personal communications that ever existed – the mobile phone" (Ibid, 15).

From 2005-2011, Van House conducted a number of related studies exploring the transition of image-making practices from film to digital, and her findings reveal that the digital environment, as well as changes in social and cultural approaches to visual communication, encourage spontaneous, opportunistic image-making and experimentation (Van House 2011, 127-8). Digital technology and its associated practices have increased the volume of images available and, as a result, people are accessing and using more photographs, including those made by family, friends and strangers (Ibid, 130). Earlier research on photography and memory conducted by van Dijck reveal how personal photography has shifted in the past twenty years from being a tool for memory to being a means of communication (van Dijck 2008, 60). Instead of documenting major

events and family history, personal photography has evolved into a form of identity formation and a tool to chronicle everyday experiences. This is evident in the proliferation of the selfie as a style of personal portraiture typically created with a camera phone. Studies on American teenagers and camera use reveal a preference for photography as social communication (Schiano, Chen and Isaacs 2002; van Dijck 2008). "[I]ndividuals articulate their identity as social beings not only by taking and storing photographs to document their lives, but by participating in communal photographic exchanges that mark their identity as interactive producers and consumers of culture" (van Dijck 2008, 63). Interest in studying personal digital photography is attributed to the fact that prior to the Internet, access to personal photography was limited to physical interactions with owners and their photo-albums. The emergence of photo-sharing and social networking sites has provided a platform for individuals to deliver their images to millions of viewers (and researchers). Nevertheless, as an area of study, personal digital photography is noted as being underrepresented in academic research and lacking in theory (Van House 2011, 125).

An extensive review of literature and studies exploring digital photography through an examination of its technological, social and cultural factors, shows the introduction of a number of concepts that are new to the discourse of photography and relevant to discussions within the archival community regarding the characteristics of digital photography. These concepts are: *media convergence, connectivity, ephemerality* and *performance*. During the review it became apparent that authors use different terminology to express similar concepts. For example, the concept of connectivity is also referred to as "mobility" and "liquidity," though they do not intend to convey exactly the same idea. Considering the interdisciplinary nature of this

investigation, this discussion involves a confluence of theory and methodologies to reveal similarities and differences in the application of concepts. Attempts have been made throughout the following subsections to clarify terms and explain differences by highlighting the context in which they originate and the relevant works.

2.3.2.1.1 Media Convergence

Convergence is a term that is used to describe the technological, industrial, cultural and social changes in the way that media circulate within our culture (Jenkins 2006; Dwyer 2010; Van House and Churchill 2008). Media convergence is the process whereby new technologies are accommodated by existing media and communication industries and cultures (Dwyer 2010, 2). It is used to describe the adaptation, merging and transitioning that occurs when old and new technologies converge. In the context of digital photography, media convergence can be used to reference the flow of photographs between and among cameras, mobile phones, computers and the Internet. At one time, these devices and their technologies were distinct and self-contained, but now they are recombined into a new distribution mode, streamlined across platforms and devices. As a result, the way people use media changes. A mobile phone that also takes photographs, videos and email messages is an example of the convergence of telephony technology with digital photography, digital video and messaging. Media convergence can be seamlessly integrated into devices so that users are left unaware of the layers of distribution involved in accessing and delivering their digital photographs. This can present a situation in which both management and preservation of personal digital photographs is hindered due to a lack of knowledge about the processes and services involved, including the location (i.e., cloud computing).

Several scholars have shifted their focus from memory objects (e.g., digital photographs) to memory technologies, which are the socio-technical practices involving creation, sharing and storage that impact what is remembered individually and collectively (Sturken 2008; Van House and Churchill 2008). In doing so, they draw attention to the new relationships being forged among personal photography, social media platforms and archival practices: "People take more pictures by orders of magnitude than before, and keep most if not all of them on personal hard drives, making archiving and retrieval problematic. The emergence of sites like Flickr.com, where images can be viewed by anyone and everyone, is facilitating new public and collaborative uses of what were once private images" (Van House and Churchill 2008, 297). Media convergence expands the potential relationships between photographs and also enables photographs to flow across devices and platforms (Jenkins 2001). It is important to note that convergence doesn't erase photography; rather, it alters the practice and the ways in which people use photographs.

2.3.2.1.2 Connectivity

In the *Merriam-Webster Dictionary*, connectivity is defined as: "1) the quality, state, or capability of being connected; 2) the ability to make and maintain a connection between two or more points in a telecommunications system, or computer system." In the context of digital photography, connectivity also refers to mobility and describes the characteristic of digital photographs to change, to be acted upon by individuals and systems, and to continually transform through multiple representations (Hand 2012, 26). This subsection discusses the

connectivity of digital photographs within social networking sites and the characteristic of connectivity in the online platform.

In the last decade, digital photography has taken the place of film-based photography for most personal uses (e.g., travel, family and events). The emergence of online photo-sharing and management sites like Flickr is encouraging individuals and organizations (through *Flickr Commons*) to share and manage their digital photographs (born-digital and digitized). In doing so, photo-sharing sites perform as online social networks that are characterized by visual communication. The process of sharing photographs is facilitated through the online application's graphical user interface (GUI), which provides an 'upload' tool, as well as rich site summary (RSS) feeds, email, and third-party plug-ins for *iPhoto*, *Lightroom* and other image management applications (Yahoo! 2013).

The process of managing (i.e., classifying and organizing) digital photographs collections stored in online platforms involves collaboration among other members of the online community. For example, Flickr users are encouraged to give their contacts permission to add comments, notes and tags to their personal digital photographs, which become associated as social metadata and are used by the social media application to discover, search and organize images within the collection and across collections. The collaboration can take different forms, but it is characterized by the break down of boundaries between producers of content and the users of content.

When users contribute to a digital photograph, they are transformed from consumers to producers and are engaged in a process of *produsage* (i.e., the collaborative and continuous building and extending of existing content in pursuit of further improvement) (Bruns 2007). Research into photo-sharing communities and online image-making practices refer to members as *produsers*, to characterize a level of participation and to point out that the aim of the process is not to create a discrete, complete product. Unlike a traditional photographic print, which is fixed as a discrete object, the digital photograph is always connected to a system or interface, which enables changes to occur. In this sense the networked photograph is always in the process of becoming and the social media platform acts as both a structure for and a mediator of interactions between individuals and the collective (van Dijck 2011; Van House and Churchill 2008). It has been suggested that social media platforms acting as facilitators and repositories of cultural connectivity are substantially changing what counts as experience and memory (Hoskins 2009: van Dijck 2011, 404). “In these circumstances, remembering becomes less a matter of patchy reimaginations and reconstructions drawn from the traces of declining lives and decaying objects and media, and more a matter of personal and public hyperconnectivity strung out in multiple and mobile real-times” (Hoskins 2015, 664).

2.3.2.1.3 Ephemerality

In the *Oxford Dictionary*, ephemeral is defined as: “lasting for a very short time.” In the context of digital photography the quality of an image being ephemeral is closely linked to its use as visual communication and not as an object to be permanently preserved. Unlike chemical photography, which requires time and energy to create, print and distribute, digital photography is considerably more immediate in its production, dissemination and consumption. The shift

from long-term to short-term value is not simply a result of technology, it is an expression of changing cultural attitudes and social uses of digital photographs.

The research conducted by Van House into image-making practices with mobile phones and Flickr suggests that new technologies and social practices are changing the temporality of images: people are using digital photographs as a form of visual communication without expectations of permanence (Van House and Churchill 2008). Initial studies suggest that the fragility of digital photographs (i.e., easily deleted, lost and corrupted) encourages an approach to image-based activity as immediate and short-lived (Van House 2011, 130). However, recent developments in communications technology that allow creators to program deletion of their digital photographs, such as the unique photo-messaging application *Snapchat*, may be based less on media fragility and more on a growing awareness that managing large dispersed collections of digital photographs is onerous, controlling the dissemination and reuse of digital photographs is nearly impossible, and online privacy is becoming a commodity as the monetization of personal information and social media content becomes standard practice for businesses operating in the online environment.

The Snapchat application enables users to take photos, add text, and send the images to a controlled list of recipients – with a time limit on how long recipients can view the received images (up to 10 seconds). Once the time limit is reached, the images are deleted from the receiver's phone. Since 2012, the total number of “snaps” shared through the service per day has increased from twenty million to four hundred million (Snapchat 2012; Smith 2015). Snapchat, more so than other photo-sharing applications, enables users to focus on communicating with

images, without the burden of managing or storing them. This application epitomizes the new attitude towards photography, one that values communication over preservation. Traditionally, the value of photography has been strongly linked to the activities of collecting and the concepts of memory and permanence; however, the philosophy of Snapchat is: "[t]here is value in the ephemeral" (Snapchat 2013).[6] The extent of the life of digital information on the Internet is an area that concerns everyone, including archivists. Emerging services and laws aimed at supporting activities of forgetting can be seen as part of a growing effort to protect potential abuses of aging information in the online environment (Ambrose 2013).

2.3.2.1.4 Performance

In *Camera Lucida,* Barthes describes the relationship between the photographic image and the actual person or place it represents as "that-has-been"; which can be interpreted to mean that the image is a pictorial representation of someone or something that was once in front of the camera, but is now no longer there (Barthes 1981, 76: Sandbye 2012, 1). Current approaches to understanding the immediacy and presence that characterizes digital photographic practice are exploring digital photography as a performance practice that represents "this-is-happening" or "The Now" (Sandbye 2012, 2; Golding quoted in Rubinstein 2015). In contrast to Barthes' discovery of the definitive characteristic of photography, the historical moment of "that-has-been," the performance practice is expressed in relation to how digital photography is used and the rhetoric of representation (Barthes 1981, 77). Mette Sandbye's research on web albums (i.e., logical organizations of personal digital photographs on Flickr, Facebook and *Picasa*) reveals

[6] As of 2015, the Snapchat philosophy is no longer available on their home page. A blog post by Snapchat CEO, Evan Spiegel in 2014 frames the philosophy of Snapchat in terms of online privacy and an attempt to protect users from the expansion of capitalist agendas to invade personal relationships set by for-profit social media service providers (Snapchat 2014).

that the volume of digital photographs on photo-sharing sites, their sequencing and their subject matter are presented in a manner that reflects the structure of cinema and enables the viewer to experience the unfolding (i.e., performance) and occurrence (i.e., presence) of the photographic moment. The general definition of the verb to perform is “to carry-out” and the definition of presence is “occurring” (Oxford Dictionary 2013). Unlike traditional photographic practices in which only one group photograph might be taken to represent an entire evening at a special celebration; digital photographs are continually being created throughout any and all events, no matter how banal the activity.

The performance of photography is traditionally considered in relation to the staging of the event in front of the camera prior to image capture, and in relation to the show-and-tell (i.e., storytelling) of presenting an album of family photographs to another person. Sandbye introduces the performance of digital photography in the context of articulating and transmitting a feeling of presence (Sandbye 2012). This is achieved through the immediacy of uploading digital photographs to online platforms so that other users can view and respond either with comments or with links to their own digital photographs that might be related or highlight a similar experience. Sandbye points to other research on personal digital photography that discuss the volume of digital photographs documenting a single event and shared online, emphasizing the mundane nature of the image content and the similarity between the multitudes of images of a single event (Murray 2008; Sandbye 2012, 6). Furthermore, research conducted by van Dijck on photo-sharing communities suggests that once the digital photograph becomes part of the online environment, its performance function changes every time the digital photograph is accessed (van Dijck 2008).

2.3.2.2 Professional Digital Photography and Evidencing Practices[7]

The term *evidencing practices* refers to a range of imaging activities in the online environment, including selfies and citizen journalism (i.e., public citizens disseminating newsworthy photographs), that "testify to experience…and accrue social and cultural value as evidence…" (McQuire 2013, 226). The incorporation of digital cameras into the professional practice of photojournalism in the 1990s enabled in-camera editing and increased the speed of transmitting digital photographs to news services via satellite phones. The adoption of digital technology by photojournalists also had an impact on the public's belief in the trustworthiness of news photographs due to incidences in which news photographs were altered. For example, in 2003 Los Angeles Times' photojournalist Brian Walski combined two digital images of a British soldier directing a group of Iraqi citizens into one image (i.e., a composite) that was more dynamic than the singular versions; however, he did not declare that any manipulations had been made and upon discovery the newspaper had to publish an apology and severed its relationship with Walski (Bersak 2006). Unlike fine art photography or photographic images used in advertising, which are guided by aesthetics and sales, news photography is presented as visual evidence of something or someone in the real world, and the truth of a news image rests in its correspondence to reality (Huang 2000). In an article discussing Walski's actions, the inviolability of news photography is raised. "Remember: *news photographs are the equivalent of direct quotations* and therefore are sacrosanct... the key elements of a news photograph, like the key words in a direct quote, simply are off limits to manipulation" (Van Riper 2003). The actions

[7] The material in this section draws upon the author's previously published article: Jessica Bushey, "Trustworthy Citizen-generated Images and Video on Social Media Platforms," in *Hawaii International Conference on System Sciences (HICSS) Proceedings*, January 5-8, 2015. 1553-1564. Kauai, Hawaii, IEEE Computer Society.

of Walski introduced the possibility that any number of other reporters and photographers could do the same thing (Ibid). In response, professional press associations began to update their codes of ethics and publicly reprimand offenders (Bersak 2006). Even though journalism scholars and practitioners concur that the photograph's fidelity to the real world has been subject to speculation long before the transition to digital media, the shift from film-based to pixel-based visual reportage increased public scrutiny of the institution of journalism and raised questions regarding professional credibility.

In recent years, the availability of affordable mobile phones with high-resolution digital cameras and video capabilities, coupled with Internet connectivity and the spread of broadband services throughout the globe, have enabled a new form of visual reportage called citizen journalism, which is characterized by the non-professional status of the creators and the participatory nature of their involvement with the event. Initial responses to the role of citizen journalists by professional photojournalists have been critical, emphasizing the lack of adherence to professional codes of conduct and an ignorance of professional photographic practices that incorporate image metadata capture to establish the reliability and ensure the authenticity of the digital image or video (Singer et al. 2011). Ironically, informal studies reveal that the blurry, amateur quality of camera phone images may increase the public's confidence that the footage is authentic (Ibid).

Research on the selection and circulation of news photographs by image brokers in the news media industry reveals an increase in demand for visual content in order to fulfill a myriad of online news and "infotainment" platforms (Gürsel 2012). The traditional newsroom model for

sourcing photographs, as well as procedures of selection and dissemination have been supplanted by the immediacy and global reach of the online environment. Newsroom decisions regarding who creates newsworthy photographs are being driven by economics, which means that amateur "eye-witness" accounts of events captured with camera phones provide inexpensive and immediate documentation. These circumstances present the opportunity for manipulation (either in the presentation of the subjects and event, or of the actual image content), transmission errors and incomplete captioning, all of which lead to inaccurate and possibly falsified digital images being published (Carlson 2009). The inability to verify the accuracy, reliability and authenticity of digital photographs prior to publication does not stop the images from being used in the mainstream media; instead, they are disseminated with the caption: "[Name of news producer here] cannot authenticate the image" (Taylor 2013).

A major theme in the journalism literature is how to create demonstrably reliable and authentic digital photographs and re-establish the trust between the news media and its public. One approach is the revision and enforcement of professional codes of ethics for photojournalists, specifically aimed at limiting the alteration and manipulation of digital photographs (Carlson 2009; NPPA 2012; Schwartz 2003). Ethical codes promoted by professional associations for visual journalists, emphasize the importance of maintaining the integrity of a photograph's context and content in order to protect the trustworthiness of photographs and perpetuate the role of journalists as trustees of the public (NPPA 2012). Unfortunately, ethical codes are limited in scope when applied to citizen journalists and individuals simply sharing their footage of a newsworthy event on social media platforms (Schwartz 2003; Fetveit 2013).

However, the use of digital image metadata to provide technical and descriptive information, which contributes to the identity and integrity of digital photographs and provides a method for showing the reliability of an image and establishing its authenticity, has gained considerable adoption by professional photojournalists and throughout the visual imaging industry. All digital imaging devices and software support the standard for technical image metadata, Exchangeable Image File Format (Exif), and provide methods for photographers to add descriptive metadata, International Press Telecommunications Council (IPTC) Core & Extension, to images through commercially available applications (e.g., all *Adobe* products) (JEITA 2002; IPTC 2014). The Exif schema captures technical information, including camera make/model, date & time, GPS data, image dimensions, and color space. The IPTC Core & Extensions schema captures descriptive information, including photographer name, subject and copyright/licensing terms. In 2007, the American Society of Media Photographers (ASMP) was awarded a Library of Congress National Digital Information Infrastructure and Preservation Program (NDIIPP) grant to publish *dpBestflow.org*, a best practices workflow for photographers working with digital images and video. The publication highlights the IPTC photo metadata standard for describing images and image ownership, along with Exif, as essential to establishing provenance and enabling discovery and use (Krogh 2013).

The International Press Telecommunications Council (IPTC) Photo Metadata Working Group conducted a survey on the removal of embedded image metadata from digital images by social media platforms from 2009-2013 as part of the larger Embedded Metadata Manifesto project (IPTC 2013). The IPTC study analyzes the association of Exif and IPTC metadata with a digital photograph in the context of social media platforms, typically photo-sharing services (e.g., Flickr, *Tumblr* and *Dropbox*) and social networking services (e.g., Facebook, *Google+* and

Twitter). The study employed four scenarios to test whether or not image metadata remains linked to the photograph, including viewing the digital photograph online in the social media platform and downloading the digital photograph from the social media platform onto a personal computer.

The findings of the IPTC Photo Metadata Working Group study reveal that image metadata is inconsistently supported across social media sites and that the two most popular sites for sharing digital images, Flickr and Facebook, remove embedded metadata from the image file header during procedures for uploading a digital image to the social media platform and downloading a digital image onto the desktop from the social media platform (IPTC 2013). These research findings were unexpected and distressing to the professional photography community, which recommends the use of Exif and IPTC image metadata to effectively manage digital image collections and control reuse (Krogh 2013). Prior to the release of the IPTC Photo Metadata Working Group survey findings, a number of social media providers were contacted and invited to respond; yet none did.[8] The removal of image metadata during actions of uploading and downloading digital files into and out of social media platforms presents a real threat to establishing and maintaining the trustworthiness of digital images stored in online collections.

The approaches discussed thus far have presented the perspective of professional associations and individuals operating within established news media frameworks. The concerns of professionals may be in conflict with those of citizen journalists, activists and individuals documenting their personal lives, especially in regard to the role of image metadata and their

[8] This information was shared during a telephone conversation with David Riecks, a member of the Embedded Metadata Manifesto project and owner of the Controlled Vocabulary website, 24 February 2015.

removal by social media platforms. The concept of privacy within the online environment is a complex and increasingly important issue. Many users of photo-sharing and social networking sites are becoming aware of the challenges to protecting individual privacy while engaging in activities of sharing online. The removal of Exif metadata from digital photographs, specifically geospatial coordinates (e.g., GPS metadata element), allows the individual to protect the location where the photograph was taken and potentially any persons represented in the image. Individuals can remove the Exif metadata automatically captured by their digital devices by using an image editing application. It is not difficult to imagine a number of newsworthy circumstances in which revealing the location of a person in the photograph, or the location where the photographer is based, could jeopardize the lives and liberties of individuals.

A number of initiatives that embrace citizen-generated content have arisen, such as *Allvoices* (recently changed to PulsePoint http://www.pulsepoint.com), *Citzenside France* (http://www.citizenside.com), and the *Independent Media Center* (www.indymedia.org). A review of these sites reveals different approaches to establishing the trustworthiness of citizen-generated photography and video, some aimed at the technological level and others at the administrative process. Allvoices invites individuals to submit original stories, images and videos to the site and then combines the submissions with related articles that are aggregated from mainstream news organizations. Contributors must abide by a lengthy Terms of Use policy, which outlines the rules and responsibilities governing the creation of content that is free from copyright infringement and privacy restrictions. Furthermore, professional editors curate all the content posted on the Allvoices site. The methods employed by Allvoices, those of a curatorial process in combination with related aggregated news sources, and the Terms of Use policy contribute towards ensuring trustworthy visual reportage.

Citizenside France provides a news platform for citizen journalists, professional photographers and videographers to submit original content. It utilizes a number of methods for sourcing user-generated content, including a proprietary interface, the Newzulu / Citizenside Social Media Reporter. A visit to the Citizenside homepage presents a number of news reports with the tag "vetted story" over each image. In addition to the Terms of Use policy, Citizenside employs a number of methods for validating submissions prior to distribution, including editorial review and validation of content through social gaming capabilities built into the platform to ensure integrity of the image and credibility of the photographer.

The Independent Media Center is a network of independent media organizations and journalists dedicated to providing independent reporting on social and political issues. Indymedia arose in response to the protests against the World Trade Organization conference in Seattle (1999). One of the underlying concepts of Indymedia is open publishing, which requires that the process of creating news be transparent to the readers. In the context of trustworthy news images, the open-publishing model provides the opportunity for readers to participate in the creation of the news, as well as its consumption. The audience is free to investigate the accuracy of a news story uploaded to an Indymedia site and provide additional evidence that contradicts or supports the earlier account. In many respects, these activities reflect traditional approaches to ensuring reliability in news reportage, such as fact checking, eyewitness's corroboration, cross-referencing with other data and contacting the source. The online environment presents readers with access to digital applications to assist in analyzing news images to determine prior use (e.g., TinEye, reverse image search tool) and digital manipulation (e.g., FotoForensics, an error level analysis tool).

A more recent development is that contributors to Newzulu / Citizenside can insert the hashtag '#newzulu' in their Twitter and Instagram post and the news media platform will automatically acquire and validate the submission. The massive popularity of social media platforms establishes photo-sharing and networking sites as the *de facto* providers for images and videos that "go viral." As a result, citizen journalists and professionals use Twitter to disseminate newsworthy images in real time on a global scale – as evident during the Arab Spring (2011) and recent political protests in Turkey, Ukraine and Thailand. News organizations that integrate technological platforms to enable the sharing and authentication of user-generated content, such as those being employed by Citizenside, are providing innovative solutions to curating the deluge of digital content. The administration, platforms and community participation discussed in this subsection can inform archival approaches to acquiring social media photographs and establishing their trustworthiness.

2.4 Photography and the Law[9]

2.4.1 The Law of Evidence and Photography

Since its inception in 1826, the photograph has played an important role as documentary evidence of past events, persons and places. Photography's early association with science and accurate reproduction attributed to the medium by its mechanical production and seeming lack of

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[9] Citations of cases and statutes throughout this section have been formatted in accordance with *McGill Law Journal Canadian Guide to Uniform Legal Citations* (McGill Guide 2014).

The material in this section draws upon the author's previously published article: Jessica Bushey, "Trustworthy Citizen-generated Images and Video on Social Media Platforms," in *Hawaii International Conference on System Sciences (HICSS) Proceedings*, January 5-8, 2015. 1553-1564. Kauai, Hawaii, IEEE Computer Society. ©2015 IEEE.

human intervention positioned it as a powerful juridical tool (Mnookin 1998, 4). The photograph's optical capacity to extend the power of human observation (e.g., enlargements) made it useful to law enforcement. The application of photography in the law was predicated on the belief in the accuracy, reliability and authenticity of photographs as visual recordings of the real world (Schwartz 2000). This belief was based, to an extent, on the Anglo-American justice system's approach to admitting photographs as documentary evidence. "The admissibility of photographs resulted in the reconceptualization and invigoration of an entire category of evidentiary representations, ushering in a 'culture of construction' in the courtroom" (Mnookin 1998, 5). Since the early 1900s, statutory and common law evidence rules have allowed photographs to be introduced as evidence of facts related to legal proceedings, albeit with increasing controls over their admissibility.

The law of evidence governs the admissibility of testimony and exhibits and is based on legal principles and the rules of evidence. The rules of evidence regulate proof and procedure in legal proceedings and were developed through judicial decisions initially and legislation in the Nineteenth Century. In common law systems such as Canada and the United States, photographs as evidence must satisfy rules related to pretrial procedures of documentary discovery and disclosure, and at trial rules around authentication, hearsay and best evidence (Duranti, Rogers, and Sheppard 2010).[10] In the United States and Canada, the codification of the rules of evidence is demonstrated in the 1975 U.S. *Federal Rules of Evidence Act (FED R EVID Act)*, state evidence Acts, the *Canada Evidence Act (CEA)* of 1985, and provincial evidence Acts. The *Uniform Electronic Evidence Act (UEEA)* of 1998 is model legislation that is largely

[10] Quebec has a hybrid legal system of civil and common law.

implemented by Canadian jurisdictions (Ibid, 102). The *FED R EVID Act* governs the overall admissibility of evidence in civil and criminal proceedings in the courts of the United States of America. The *FED R EVID* were adopted by the Supreme Court on November 20, 1972 and are considered legislative enactments that have the force of statute, and courts interpret them (United States Government 2001). The *CEA* governs the admissibility of evidence in Federal Court proceedings in Canada and criminal proceedings, whereas each province has its own evidence Act for civil proceedings.[11] In 1998 the Uniform Law Conference of Canada adopted the *Uniform Electronic Evidence Act (UEAA).* The *UEEA* was implemented through the enactment of the *Personal Information Protection and Electronic Documents Act (PIPEDA)* and amendments to federal and provincial evidence acts, reforming traditional common law evidentiary requirements for proof of authentication and best evidence rule. The sections of the *CEA* that include the *UEEA*'s provisions are: sections 31.1-31.3 (Duranti, Rogers, and Sheppard 2010).

The Acts are updated periodically; yet, the legal literature addressing digital photographs as evidence raises issues about the lack of precise terminology in the Acts regarding photographic film and prints vs. digital photographs, and digital photographs vs. electronic documents, as well as the inadequacy of existing authentication methods for addressing new technologies. As observed by Mnookin (1998), judges are increasingly challenged to make legal sense of new technological forms through analogies with existing ones (e.g., social media photographs and photographic prints), which can only be extended so far.

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[11] *Canada Evidence Act*, RSC 1985, c C-5

The following subsection will present an overview of the *FED R EVID* and the *CEA* that address the evidential requirements of authentication and identification and are generally applied to photographs and, by extension, to digital photographs. Included in this discussion are the various methods that support a verification of the authenticity of photographs as evidence, drawn from existing evidence law and legal literature. In the context of this dissertation, verification is defined as: "the act or process of establishing a correspondence between known facts about the [photographic] record and the various contexts in which it has been created and maintained, and the proposed fact of the [photographic] record's authenticity" (Duranti 2005, 50).

Soon after its invention in the early 1800s, photography began to appear in evidence at trials in the United States. In *Luco v The United States,*[12] photographic reproductions of seals and signatures were admitted as documentary evidence after they had been found relevant and were properly verified. Relevance requires that all matters offered in evidence must tend to establish or disprove the issues in the case (Scott 1942, §602, n.14). Relevance must be established for any photograph submitted as a potential piece of evidence if its relevancy is challenged; and it is typically established through content (i.e., subject matter) and origin of the photograph. Relevance is addressed in *FED R EVID* 401- 403.

After establishing relevancy, proper verification of the photograph's content is required. For the majority of photographs introduced as demonstrative evidence (that is, as evidence of their content), the court is concerned with the fair and accurate portrayal of what the photograph

[12] *Luco v The United States,* 64 US 515 (1859).

purports to depict. In *State v Evans,*[13] the court recognized that "…distortion is possible through the manner in which the camera to negative is used, it is common not only to permit but to require evidence that the print is an accurate reproduction of the object photographed." *FED R EVID* 901 addresses requirements for authenticating and identifying evidence, stating in Rule 901(a) that in order to satisfy the requirement, the person proposing its inclusion must produce proof sufficient to support a finding that the photograph is what the proponent claims it to be (2013). Under *FED R EVID* 901(b)(1) a witness with knowledge can testify that the photograph is what it claims to be. This has been the most accepted method for authenticating photographs as demonstrative evidence in *R v Tolson,*[14] when a photograph was admitted to prove the identity of an individual. In regards to verification, *Thompson v DeLong*[15] states that, for the verification of the accuracy of the photograph, preference is given to the photographer responsible for taking the photograph. However, as discussed in *R v Bannister*[16] and *Adamczuk v Holloway,*[17] the person providing the testimony needs to have knowledge of the issue at hand and be familiar with what is being represented in the photograph, but is not required to be the actual photographer that created the photographic print, or to have any knowledge about photography and the mechanics of a camera.

The ruling on the admissibility of photographs in *R v Creemer and Cormier*[18] was not the first Canadian case to deal with the admissibility of photographs, but it is cited as the definitive statement for determining the requirements for the admissibility of photographs: "All the cases

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[13] *State v Evans,* 115 Kan 538, 224 P 492 (1924) cited in (Scott 1942, at §604, n 48).
[14] *R v Tolson* (1864), 4 F & F 103, 176 ER 488.
[15] *Thompson v DeLong,* 110 A251, 267 Pa 212, 9 ALR 1326 (1920) cited in (Kennedy 1956, 727).
[16] *R v Bannister* (1936), 66 CCC 38 at 41 (NBQB).
[17] *Adamczuk v Holloway,* 13 A (2d), 338 Pa 263 at 265 (Sup Ct 1940).
[18] *R v Creemer and Cormier,* [1968] 1 CCC 14 at 22 (NSCA).

dealing with the admissibility of photographs go to show that such admissibility depends on (1) their accuracy in truly representing the facts; (2) their fairness and absence of any intention to mislead; (3) their verification on oath by a person capable to do so." Put another way, admissibility depends upon the accuracy, reliability and authenticity of the photograph. In contrast, a photograph may be inadmissible because the scene portrayed in the photograph is irrelevant, or because the photograph has been manipulated, as stated in *United States v Stearns*.[19]

The legal literature raises questions regarding the adequacy of witness testimony to authenticate digital photographs, arguing that the ease of performing seamless alterations to digital files, combined with the length of time it takes a case to come to trial, may result in witnesses unknowingly authenticating falsified digital photographs (Coats and Ramsay 2000). If the testimony of the witness is challenged, cross-examination of the witness is allowed and, during that process, the witness can provide proof of an unbroken chain of custody, also referred to as continuity, which goes to the weight of the evidence and can assist in proving the integrity of the photograph in question. The purpose of testimony is to authenticate the evidence by testifying to its authenticity through establishing the photographer, the source of the photograph and/or the objects or persons represented in the photograph. Once testimony has been received it is then subject to cross-examination by opposing counsel. Cross-examination may establish that the photograph is not what it purports to be and is therefore, not authentic.

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[19] *United States v Stearns*, 550 F (2d) 1167 at 1170 (9th Cir 1977).

An exception to admitting photographs as demonstrative evidence is presented in *R v Nikolovski*,[20] in which a trial judge identified the accused through analysis of still photographs taken from a convenience store surveillance video. In this manner, the video was treated as real evidence and no witness testimony was required. The case was appealed and went before the Court of Appeal of Ontario, which found the conviction unreasonable on the basis that no witness corroborated that the person shown in the videotape was the accused. Later, the order of the Court of Appeal was set aside by the Supreme Court and the conviction was restored; however, the trial judge was criticized for basing a conviction on her untested opinion.

The authentication of electronic documents in *CEA*, section 31.1 states that a person seeking to admit an electronic document as evidence must prove its authenticity by evidence that supports a finding that the document is what it is purports to be. In *R v Adams*,[21] digital photographs stored on a compact disc are treated as electronic documents as defined in *CEA*, section 31.8. If the digital photograph is being submitted as a business record (i.e., a record made in the usual and ordinary course of business), then the requirement is proof of the integrity of the electronic document system that recorded or stored the document (*CEA* section 31.2(1)) or, in absence of evidence to the contrary, a printout is accepted if it has been consistently relied upon as the record (*CEA* section 31.2(2)). The presumption of the integrity of an electronic documents system is provided by evidence that the computer system used by the electronic documents system was operating properly, or that its improper operation did not affect the integrity of the electronic document (*CEA* sections 31.2-31.3). In *R v Adams*, commentary is provided about police procedures for taking photographs, describing one approach with a 35-mm camera using

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[20] *R v Nikolovski*, [1996] 3 SCR 1197, 1996 CanLII 158 (SCC).
[21] *R v Adams*, 2009 NSPC 15 (CanLII), 282 NSR (2d) 211 (Prov Ct) at para 42.

photographic film and a second approach with a digital camera that uses a memory card to capture and store images.[22] In this case, the judge's decision to deny the admissibility of the compact disc created by the police to store their photographs of stolen property was due to a lack of proof of the integrity of the copying process, and the electronic documents system or computer used by the police.

The *FED R EVID* 901(b)(4) presents the opportunity for distinctive characteristics of the photograph to provide evidence that supports the authenticity of the photograph in question. *Lorraine v Markel American Insurance Company*[23] contains a lengthy memorandum opinion in which Judge Grimm suggests that metadata could be examined as a distinctive characteristic to be used to authenticate digital evidence. Judge Grimm explains that metadata can capture information needed to identify the creator of a digital record, provide the date and time, and reveal any changes that may have been made to it. In the absence of testimony the metadata could be examined, but the documentation of the metadata would need to be presented as supporting evidence and would require a person with experience or special knowledge of image metadata to examine it and present the findings to the trial court. In this instance, two rules would go hand in hand, *FED R EVID* 702 "Testimony by Expert Witness" and *FED R EVID* 901(b)(9) "Evidence about a Process or System." In 1923, *Frye v United States*[24] established the following set of criteria for testimony by expert witnesses: (1) expert's credentials, (2) expert's experience, (3) skill, and (4) reputation. If the expert witness did not satisfy these criteria, the expert opinion in the form of testimony and the related photographic evidence could be ruled

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[22] *Ibid* at paras 43 and 46.
[23] *Lorraine v Markel American Insurance Company,* 241 FRD 534 at 538 (D Md 2007).
[24] *Frye v United States*, 293 F 1013 (DC Cir 1923).

inadmissible (as was the outcome in this particular ruling.) By 1993, the United States Supreme Court held that Rule 702 superseded *Frye* as the standard for admissibility of expert evidence in federal courts. It was amended in 2000 to codify the standard set in *Daubert v Merrell Dow Pharmaceuticals Inc*[25] and amended once again in 2011. The current version states that testimony of an expert witness is admissible if:

> "(a**) t**he expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
>
> (b) the testimony is based on sufficient facts or data;
>
> (c) the testimony is the product of reliable principles and methods; and
>
> (d) the expert has reliably applied the principles and methods to the facts of the case" (*FED R EVID* 2013, 702 a-d).

Under Rule 901(b)(9) the expert witness testimony is to describe the process or system that produced the photographs and/or their metadata in question, and to show that the process or system can produce an accurate result.

Early scientific evidence photographs such as X-rays and photographs of fingerprints were initially authenticated in a similar manner to maps, drawings and other demonstrative evidence (i.e., verification by a person able to do so); however, in *Smith v Grant,*[26] the rules for their admissibility required testimony of an expert witness and demonstration of the reliability and validity of the scientific process used to create the image (Goldberg 2013, 53). The requirements

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[25] *Daubert v Merrell Dow Pharmaceuticals Inc*, 509 US 579 (1993).
[26] The District Court of Colorado filed its opinion of *Smith v Grant* on December 3, 1896, but because the decision was not appealed, *Smith v Grant* did not become a case of record (Thurston 2001, n.p. ft nt 6).

of *FED R EVID* 702 and 901(b)(9) are used to determine the admissibility of enhanced digital photographs produced during an investigation by forensic imaging experts. The decision in *State of Connecticut v Alfred Swinton,*[27] concerning the admissibility of an enhanced photograph through supporting evidence provided by testimony about the reliability of a forensic imaging process established that the earlier standard set by *Daubert* in 1993 was only a threshold inquiry into the admissibility of scientific evidence as other evidentiary rules must also be satisfied. The 2004 six-point test used in *Connecticut v Swinton,* was based on *Nooner v State,*[28] and states that problems with the reliability of computer generated evidence must be addressed through the reliability of the procedures involved and the opportunity to cross-examine the witness about the methods used and the reliability of the system: (1) the computer equipment is accepted in the field as standard and competent and was in good working order; (2) qualified computer operators were employed; (3) proper procedures were followed in connection with the input and output of information; (4) a reliable software program was utilized; (5) the equipment was programmed and operated correctly; and (6) the exhibit is properly identified as the output in question.

There are instances when a party is attempting to prove the truthfulness of the verbal contents of a photograph without testimony. Under *FED R EVID* 1002 an original photograph is required in order to prove its verbal content. *FED R EVID* 1001-1008 address the requirements for an original writing (also referred to as the best evidence rule). Rule 1001(c) defines a photograph as a photographic image or its equivalent stored in any form, and (d) an original photograph to be either a negative or print. The rule also defines an original of electronically stored information as a printout or other output readable by sight, as long as it accurately reflects the information. Rule

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[27] *State of Connecticut v Alfred Swinton,* 847 A (2d) 921 (Conn Sup Ct 2004).
[28] *Nooner v State,* 907 SW (2d) 677 at 686 (Ark Sup Ct 1995).

1003 permits a duplicate to be used and Rule 1004 dismisses the requirement for an original photograph if: (a) the original is lost or destroyed in good faith, (b) cannot be obtained, (c) is in possession of the opposing side, or (d) goes to a collateral matter. This rule is criticized in the legal literature as favouring traditional analogue photography in which a negative or photographic print would provide an opportunity for analysis, either of the original itself and its contents, or as a comparison against the photograph in question to reveal any changes that may have been introduced in darkroom procedures or during the photograph's course of use (Guthrie and Mitchell 2007). Determining which is the original in the digital environment is not so straightforward. In general, professional photographers designate the digital image file downloaded from the camera as the original (Bushey 2005). It could be argued that all digital photographs are copies of the original image data captured onto the sensor of the camera. As discussed earlier, the *CEA*, section 30.1 suggests that for digital photographs the proof of the integrity of the electronic records system should satisfy the best evidence rule.

2.4.2 Literature and Case Law on Digital Evidence and Social Media Photographs

A major theme in the North American legal literature is the inadequacy of existing rules for identifying and authenticating evidence when dealing with digital photographs and, more recently, with images accessed and stored in social networking sites (Wiebe 2000; Mehlman 2012). Concerns are being raised by litigators and legal scholars regarding the ease of digital manipulation and the potential for falsified photographs to be admitted into evidence at trial (Witkowski 2002). It is recognized that “social media is becoming pivotal evidence in a court of law,” yet the laws being applied in the digital environment are based on a paper environment. In response to the ubiquity of digital documents, images and videos in contemporary business and

personal activities, the legal community is discussing approaches to managing digital evidence and to establishing its authenticity (Nay 2012). In some cases the courts apply existing authentication rules to social networking evidence, whereas in others the reliability of the evidence is questioned and as a result, requirements for admissibility are increased (Mehlman 2012, 9). The following section highlights the key publications in regards to contemporary legal approaches to social media evidence, particularly social media photographs (i.e., digital photographs shared and stored on social media platforms).

In 2007, the United States Federal Judicial Center authored, "Managing Discovery of Electronic Information: A Pocket Guide for Judges," which discusses how electronically stored information (ESI) includes digital images and information generated and stored on computers and systems (including cloud-based servers) that exchange digital information (e.g., metadata), and encourages judges to actively manage cases involving ESI instead of waiting for the parties to argue the matter (Rothstein et al. 2007). The first edition of this publication followed the 2006 amendments to the *Federal Rules of Civil Procedure*, in which electronic discovery issues were introduced. Considered an ESI primer, the second edition of the pocket guide was released in 2012 and reorganized into a question and answer format aimed at addressing the challenges presented by "an explosion of civil case law on ESI" (Rothstein et al. 2012, 1).

The opinion provided by Magistrate Judge Paul Grimm in *Lorraine v Markel*[29] is referred to extensively in the legal literature regarding social media and digital evidence, specifically the point that posts to social media platforms are within the scope of electronically stored

[29] *Lorraine v Markel American Insurance Company*, 241 FRD 534 at 538 (D Md 2007).

information (ESI) (Dryer 2010; Mehlman 2012, 11). Judge Grimm suggests two approaches to authenticating ESI: the first requires a witness testimony to explain the process of how ESI is created, acquired, maintained, and preserved (without alteration), and the second requires a witness testimony to identify the process by which ESI is produced if a system is relied upon to do so. Judge Grimm also suggests that metadata should be treated as a distinctive characteristic that shows the date, time, and identity of the creator of a digital record.

In light of Judge Grimm's opinion it is difficult to determine how a member of a photo-sharing or social networking site would establish the process by which ESI is produced and, in circumstances where the image metadata has been stripped-out of digital photographs shared through platforms, it would be impossible to support or refute a legal claim through the missing ESI. It is more likely that the approaches suggested by Judge Grimm would require the testimony of the service provider and assurance that the social media platform does not alter the metadata embedded in the original file of the digital image. The legal literature that addresses evidence in networked environments specifies that one of the challenges to authenticity is identifying who or what generated the digital document and determining whether safeguards have been implemented to assure continuing accuracy and integrity of the document (Reiniger 2011).

One of the earliest cases to deal with the admissibility of information obtained from Facebook is *Kourtesis v Joris,*[30] in which the plaintiff claimed to suffer chronic pain due to a motor vehicle accident, and was seeking compensation. During the trial the defense counsel submitted printouts of digital photographs posted on the plaintiff's Facebook profile. The photographs showed the

[30] *Kourtesis v Joris,* [2007] OJ No 5539 (QL) (Sup Ct (Civ Div)).

plaintiff dancing and were posted to the "private" section of the Facebook account, but the defendant had access to it because she was a cousin and therefore within the "private" sphere of friends with access. The plaintiff was given the opportunity to recall the events and explain them. Eventually, the plaintiff's general damages claim was dismissed.

In her article investigating the authentication of social networking websites, Mehlman (2012) focuses on criminal cases involving Facebook and *MySpace* (launched in 2003 as a social networking service with an emphasis on music, and rebranded in 2011). Referring to the survey of electronically stored information (ESI) authentication cases conducted by the *Lorraine v Markel* court, Mehlman points out that authentication of ESI is challenging because it can be digital photographs, e-mails, databases and/or metadata (Ibid, 11). As a starting point, courts rely on core concepts for authentication in general, such as identifying the author or creator, identifying the person who received the photograph, and determining whether the photograph is an accurate representation of a person, place, or thing. If the persons who sent the photograph, appeared in the photograph and/or received the photograph testifies to their personal knowledge that they sent it, appeared in it, were present at the scene (which the photo fairly and accurately described), or received it, then a hard-copy printout is produced and authenticated (Mehlman 2012, 12). Problems arise with authentication of social media photographs when the person against whom the photograph is offered refuses to testify and/or denies creation or recognition of the photograph. Mehlman discusses two murder cases in which social media photographs presented problems due to concerns about "the untrustworthiness of images downloaded from the internet" in *People v Beckley*[31] and "the ability to 'photoshop', [or] edit photographs on the

[31] *People v Beckley*, 110 Cal (3d) 362 at 363 (Ct App 2010) [*Beckley*]

computer" in *People v Lenihan*.[32] In the former case, the court reviewed existing case law about authenticating photographs in general and determined that social media photographs require testimony from a photographic expert that the photograph is not a composite and has not been faked. In the latter case, the court determined that there is no way to authenticate social media photographs, not even with expert testimony. In light of these cases, Mehlman suggests that photographs shared on social networking sites are unlikely to be used against a witness at trial, unless the witness concedes that the photographs are authentic or an expert testifies that the photographs have not been altered (Ibid, 19).[33]

In regards to additional features available on social media platforms, Mehlman discusses tagging people in social media photographs and adding comments to photographs as novel features without existing case law. Additionally, she observes that the meanings of tags and comments added to photographs are speculative and the potential for inaccuracies are high. As a result, the authentication of tags and comments raises general issues of establishing the author of the social network communication, determining what the photograph is intending to depict and whether it has been altered, as well as establishing the fact(s) that the tag asserts (Mehlman 2012, 20). In her conclusion, Mehlman observes that courts are just beginning to explore authentication of social networking websites and content, but that generally there appears to be a desire for heightened authentication requirements, including the need for information about security settings. Further to this point, she questions the role of Facebook and MySpace in educating their members about the potential for social media content to become evidence.

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[32] *People v Lenihan*, 911 NY (3d) 588 at 592 (NY Sup Ct 2010) [*Lenihan*]
[33] *See Beckley, supra* note 27 at 366; *See Lenihan, Ibid,* at 592.

Magistrate Judge Kristen Mix published an article entitled "Discovery of Social Media" (2011) in which she states that the recent political events in Egypt demonstrate the importance of social media for the legal profession and society at large. She explores the legal obstacles to accessing content in social media platforms and using that content at trial. She highlights *Leduc v Roman,*[34] in which the Canadian appellate court dismissed expectations of privacy in the shared online environment of social networking sites and obliged the party involved to identify and produce postings related to the matter at hand. Mix asserts that this approach places the onus on the user to produce content and avoids the formal request to the provider for the content through a subpoena. Judge Mix points out that most social media providers include a section in their Terms of Use policy that outlines their obligation to respond to subpoenas. However, courts in the United States are inconsistent in their rulings on access to social media content, at times protecting some types of social media content from subpoena under the *Stored Communications Act (SCA).* As a result, it is difficult to determine what types of social media content (e.g., wall posts vs. messaging services) may be accessed and admitted as evidence at trial. Additionally, members of social media platforms are generally unaware of the information contained in Terms of Use (TOU) agreements with social media providers, which impacts how they use the service and their expectations of privacy.

2.4.3 Social Media Services Contracts – Terms of Use

A major theme in the legal literature is the issue of legal agreements between social media platforms and their members, specifically the Terms of Service (Radin 2013; Kim 2013). The legal community refers to the type of contracts used by social media providers as "clickwrap"

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[34] *Leduc v Roman,* [2009] OJ No 681 (QL) at paras 31, 32 (Sup Ct (Civ Div)).

and “click-to-agree,” because the potential member must consent to the terms and agreement either by starting to use the software or by clicking a box onscreen that reads, “I agree.” The terms and conditions may be presented as a single document or may comprise a number of different documents, including Privacy Policy, Acceptable Use Policy, Terms of Use (ToU) and Service Level Agreements (SLA). Legal scholars suggest that, for different reasons, the majority of people enter click-to-agree contracts without reading the fine print terms even though, upon inspection, it is evident that a number of clauses are included that significantly limit member’s legal rights (Radin 2013). Furthermore, social media service providers retain the right to change their terms at any time and at the company’s discretion. As part of the research conducted for this dissertation, an analysis of social media service contracts was conducted with a focus on the key contractual constraints on images, see Appendix A: Terms of Use Comparison.

The key issues in the literature on contractual agreements between social media service providers and their customers include intellectual property licensing, control of user-generated content, reuse of content, and future access to social media accounts. Both Facebook and Instagram (purchased by Facebook in April 2012) include language in their agreements that allows for the licensing of any content posted through the service that is not explicitly marked as private; however, the ability to determine what constitutes private or public content in social media services can be challenging. The social nature of photo-sharing sites encourages members to share their content with as many friends as possible, providing the opportunity for comments, tags and ratings, which are all activities that may transform a digital photograph into public content. The literature emphasizes that the boundary between social networking and hosted site services is difficult to determine, which can impact issues related to the *Stored Communications*

Act (SCA) (Buntrock and Madden 2013; Bradshaw et al. 2011). In the context of citizen-generated content that may be used by news services, it is very important that the boundaries of legal ownership and use are clearly stated in the TOU and that the social media member understands the implications for present and future use.

In late 2012, the photo-sharing service Instagram received media attention for changing its TOU without alerting its members. The change gave Instagram the perpetual use of photographs and videos stored on its site, as well as unlimited rights to license the images to any and all third parties. The license persists even if the members download their content off the site and terminate their account (ASMP 2013). The public response to Instagram's change in TOU was negative and resulted in the temporary withdrawal of high profile accounts, such as National Geographic, as well as criticism from national associations representing professional photographers and photojournalists (Olson 2012). Instagram quickly published an apology, clarified the existing TOU and Privacy Policy for members, and provided a thirty-day grace period before any of the changes to the terms and conditions governing member accounts and user-generated content went into effect (Systrom 2012). Following this event, the American Society of Media Photographers (ASMP), on behalf of professional associations, including the British Association of Picture Libraries and Agencies (BAPLA) and the Australian Institute of Professional Photography (AIPP), published a letter to Instagram, in which it requested the following changes to the most recent TOU: provide to users the rights to close their accounts and remove permissions for use of their identities and content by the service provider at any time, and add the requirement that sublicensing or third parties use of digital photographs and videos should gain permission from and provide compensation to the creator (ASMP 2014). At the time

of writing, there has been no formal response from Instagram to the ASMP's requests. Currently, users may deactivate their accounts with Instagram by filling out a form, which will make the content no longer accessible through their account, but if their content was shared with others, it may continue to appear in Instagram and/or be licensed by Instagram for use to a third party (Deosaran 2015).

In November 2013, the foreign news association, Agence France Presse (AFP) was held liable for copyright infringement when it used photographs of the 2010 Haitian earthquake that photojournalist Daniel Morel had originally taken and posted to *TwitPic*, an early website and app that allowed users to post images to Twitter which has since been taken-over by Twitter in 2014. In the ensuing legal case between Morel and Agence France Presse, the AFP defended their actions by citing that Twitter's terms of service grants an implied license for AFP to use Morel's photographs, and that AFP was a third party beneficiary of the contract between Twitter and Morel (Haddock 2013). Later, in *Agence France Presse v. Morel*,[35] the trial court rejected AFP's argument and District Judge Nathan stated that Twitter is the only party granted license to use its members' content. Morel was awarded $303,889.77 in actual damages and infringers' profits and $1.2 million in statutory damages (Walker 2013).

Another legal concern that is being raised in regards to social media providers' terms and conditions agreements is the issue of digital assets and estate planning (Hopkins 2013). As individuals accumulate digital assets across social media services, either through the creation of content, such as digital photographs, or through the purchase of digital content, such as audio

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[35] *Agence France Presse v Morel*, 934 F Supp (2d) 547 (SDNY 2013).

files and e-books, the value of these assets need to be considered along with issues of ongoing access. Currently, e-books are provided to individuals under non-transferable personal licences and music and movies are licensed to the individual as downloaded content only (Weiland 2014, 8).

The growing volume of digital photographs created by individuals and stored in phones, computers and social media platforms is challenging traditional estate planning that focuses on the routine transfer of tangible property through inheritance. In the digital context, tangible personal property is property that can be manipulated and moved, such as computers, mobile devices and hard drives (Weiland 2014, 2). Digital photographs shared and stored across online services present several challenges to traditional approaches to managing and transferring these digital assets as tangible personal property. Instead, the digital photographs need to be approached as intangible personal property, which is property that an individual has rights of ownership, but that generally does not have a tangible physical manifestation (Ibid).

Traditionally, physical property is transferred through testamentary deposit and there are statutory rules to ensure the authenticity of the will and the testator's intent. In the case of social media photographs, it would be necessary to establish what data constitutes the content of the digital record, the right to use the record, and the method of access – is the digital photograph stored on hardware that the owner has access to, or is the digital photograph stored on servers belonging to third party service providers and only accessible on-line through a username and password (Ibid). Unfortunately, many social media providers' terms and conditions agreements restrict their members from sharing or forwarding their account to another person (Hopkins

2013, 225; Weiland 2014, 9). For example, the Terms of Service for Yahoo! includes a section titled “No Right of Survivorship and Non-Transferability,” which states that an account is non-transferable and content within an account is terminated upon death, whereas Facebook acknowledges that members own their content, but does not permit account transfers or access by personal representatives.

Recent changes to Facebook’s terms have introduced the options for members to have their account permanently deleted or memorialized in the event of death (Facebook 2015). Memorialization of an account allows for shared content to remain visible to friends on Facebook and the appointment of a legacy contact to perform limited profile management for the deceased. Under no circumstances can anyone log into the deceased member’s account. In some cases a personal representative of the deceased can have the legal right to the digital assets stored with a third party service, but have no enforceable right to access that information (Weiland 2014, 2). Additionally, personal representatives of the deceased may not be able to gain access to the account of the deceased under privacy legislation. From an archival perspective, the ways in which social media platforms memorialize the deceased and govern control over access to inactive accounts impacts the acquisition and preservation of personal digital archives by archival institutions (Acker and Brubaker 2014).

These examples reveal the need for organizations and individuals that are sharing and storing digital photographs on social media platforms to review the TOU in order to determine if the licensing clause simply asks for the rights necessary to operate the service (e.g., Vimeo needs the right to create derivative works from your video in order to encode it into different formats), or if

it asks for the rights to sublicense user-generated content for monetary gain. Issues regarding the licensing and future reuse of user-generated content are important because they may impact the ability of creators, family members, and/or archives to access and preserve social media content held in personal accounts (Hopkins 2013; Besser 2013; Acker and Brubaker 2014).

2.5 Summary

Photographs present a number of challenges to traditional archival approaches to record acquisition, management, preservation and access. The realism conveyed by photographic representation of persons, places and events has afforded photographs truth value, notwithstanding our knowledge of possible staging, cropping and manipulations. Across archival, photographic and legal domains the general methods of determining the trustworthiness of photographs rely on identifying the photographer, the process of creation, use and storage, and being able to prove that the photograph has not been accidentally or purposefully altered throughout its lifecycle. What is absent from the literature is an empirical study of how creators produce, share and store their photographs on social media, and what expectations they have of ongoing access and long-term preservation of their online personal collections. The findings of the survey of "Recordkeeping Practices of Photographers using Digital Technology" (Bushey and Braun 2007), while limited by the absence of mobile/smartphones and social networking sites at the time it was conducted, still provides a foundation for the study discussed in this dissertation.

Establishing a record's trustworthiness and maintaining it over time serves many different purposes, including accountability, evidentiary requirements, and social memory. The current

research and case law on digital records and social media platforms address two separate areas: creating and sharing activities of individuals, and the management activities of social media service providers. These issues are fairly well understood individually, but their interaction is not, nor is the implications of this combination on the preservation of social media photographs as primary sources of cultural memory. This dissertation fills that gap, at least as a preliminary investigation into how the combination of users and social media services impact the formation and characteristics of personal digital photographic collections, and the preservation of and ongoing access to them as part of personal digital archives. By utilizing an interdisciplinary lens to explore the trustworthiness of social media photographs, the study discussed in this dissertation responds to suggestions made by previous authors to approach the complexity of contemporary recordkeeping practices in the online environment through consideration of the legal and technological frameworks involved, as well as evolving socio-cultural practices.

Chapter 3: Research Design

3.1 Introduction

This chapter outlines the philosophical ideas guiding the research, the research design, and the specific strategy and rationale for data collection and analysis that have been adopted in this study.

In the past few decades, there have been discussions within the archival community about the philosophical assumptions underpinning archival theory and methods. Some archival writers have hypothesized an influence of positivism on traditional archival methodologies and suggested the adoption of methodologies associated with interpretivism (Brothman 1991; Heald 1996; Cook 1997, 2000, 2001, 2013; MacNeil 2004; Ketelaar 2002; Schwartz and Cook 2002; Gilliland and McKemmish 2004). At the center of the debate is the epistemological basis of archival theory, that is, its approach to developing knowledge and understanding. This chapter will summarize these discussions; describe the relevance of an interpretivist approach for the study of contemporary photographic practices involving mobile/smartphones and social media platforms; and introduce the research design for the study that is described in subsequent chapters.

3.2 Archival Science

In her discussion of the genesis and rationales of archival principles and practices, Gilliland-Swetland (2000) highlights the period between 1830 and 1956 as the time when archival theory and practice were codified through several key treatises and manuals. Although she commences with Circular No.14 authored by Natalis de Wailly and issued in 1841 by François Guizot,

requiring the application of *respect des fonds* and *respect pour l'ordre originel* in the National Archives of France, the main concepts and methods of archival science were articulated much earlier, starting in 1632 with the treatise of Baldassarre Bonifacio (Born 1585). Their development is documented in a sequence of manuals aimed at supporting archival education, including: *Handleiding voor het Ordenen en Beschrijven van Archieven* (Muller, Feith and Fruin 1898), *A Manual of Archive Administration* (Jenkinson 1922), *Archivistica* (Casanova 1928), *Arkivkunde* (Brenneke 1953), *Modern Archives: Principles and Techniques* (Schellenberg 1956), *Archivistica. Principi e Problemi* (Lodolini 1984), and *La pratique archivistique française* (Favier 1993). These, along with many others, such as *Manual de Archivología hispanoamericana* (Tanodi 1961), *Archival Theory and Practice in the United States: A Historical Analysis* (Berner 1983), *Archivwissenschaft* (Papritz 1983), and the most recent *Encyclopedia of Archival Science* (Duranti and Franks 2015), draw upon methodologies from diplomatics, history, and law (Duranti 1998; Duranti and Michetti 2015). These manuals have been providing archivists with the fundamental theories and methodologies that have guided their actions and continue to guide them.

However, it has been only in the course of the 20th century, with the development of archival scholarship following the introduction of archival degrees in universities worldwide, that archival theory, methodology and practices have coalesced into a science (Livelton 1996). The term archival science will be used throughout this dissertation to refer to the sum of the ideas archivists hold about what archival material is (theory) and how to treat it (methodology), and to the way archivists apply both theoretical and methodological ideas to real, concrete situations (practice) (Duranti 2001, 39).

In his article entitled “Evidence, Memory, Identity, and Community: Four Shifting Archival Paradigms” (2013) Cook reflects on the evolution of archival thinking and presents an analysis of four archival paradigms. The expression “archival paradigm” is used to refer to “the set of assumptions, principles and practices that are common to the archival community and are a model for its activities and outlook” (Gilliland-Swetland 2000, 7). Cook believes that the first archival paradigm is rooted in nineteenth-century positivism, inheriting the ontological assumption that external reality is concrete and observable and the epistemological assumption that knowledge is objective. Its focus is on the guardianship of archives as evidence, and the role of the archivist as a custodian who, following the principles of provenance and original order, arranges and describes the records of the state and the church in their legal context for use as authentic and reliable documentary sources (Cook 2013, 107). Cook does not include private records and personal archives in the first archival paradigm, as he considers archives of that time to be the byproducts of the ongoing bureaucratic procedures and transactions of government, church and business (Ibid).

Concurrently, in the context of their discussion of the evolution of scholarly research, McKemmish and Gilliland (2013) reflect upon the association of particular research methods with the positivist paradigm, which, according to them, results in the preference of quantitative research designs to explore records and recordkeeping systems. McKemmish and Gilliland note that researchers working within the positivist paradigm “espouse notions of the record and the archive associated with ideas about the objective and fixed nature of records,” due to their creation as by-products of bureaucratic activity, “and the impartial and neutral roles played by

archivists in their preservation" (Ibid, 90-93). They also observe that, until recently, research conducted on archives and recordkeeping did not explicitly acknowledge the research paradigm within which it operated (Gilliland and McKemmish 2004, 167). In fact, just as the initial idea of articulating archival paradigms, the idea of identifying research paradigms came from a postmodernism critique of archival thinking.

3.3 Postmodernist Critique of the Positivist Archival Paradigm

In the early 1990s, the spread of postmodernism in the humanities and social sciences, and the challenges posed by electronic records and recordkeeping systems to existing archival practices induced several archival writers to closely examine postmodern tenets, such as critiques of western institutions and knowledge, the notion of objective truth and the relationship between reality and representation, in relation to archival science. The ideas expressed by Foucault (1926-1984) and Derrida (1930-2004) regarding the concept of "the archive" began to be considered relevant to the archival endeavor. In his work entitled *The Archaeology of Knowledge and The Discourse on Language* (1972), Foucault rejects the notion that the past can be known exhaustively through documentary evidence of events and actions (Ibid, 130). Instead, the archives "reveals the rules of a practice that enables statements both to survive and to undergo regular modification," which is to say that knowledge materializes in fragments due to the selection, construction and destruction of documentary sources (Ibid). In his work *Archive Fever: A Freudian Impression* (1995), Derrida presents a Freudian analysis of the need to archive, in which the need to save records as evidence of actions is a manic desire (i.e., a fever), which is driven by the "fear of losing the memory of that action, and by extension, the action itself" (Ridener 2008, 105). Derrida claims that the actions taken by the archivist to appraise

records for selection and to arrange and describe them for access are rooted in principles influenced by philosophical assumptions of objectivity and control and, in addition to the documentation of the events represented in the records, produce events themselves, which should be included as part of the interpretation of the record to contribute to its meaning (Derrida 1995, 16-17).

Postmodernism led some archivists to question the theoretical principles behind the methodologies guiding archival practice, and to emphasize the role of archivists in shaping archives and influencing the scope and breadth of societal memory. Exposure to postmodernist critiques of knowledge prompted a number of archivists to declare a paradigmatic turning point (Harris 1997) and to encourage the profession to recognize the limitations of the positivist archival paradigm with its emphasis on objectivity and evidence and to develop archival theory and methodologies that would be historically situated and reflect contemporary social, political and technological contexts (Brothmen 1991; Cook 1994, 1997, 2001, 2013; Mortensen 1999; Koltun 1999; Schwartz 2000; Cook and Schwartz 2002).

In his article entitled “Claiming Less, Delivering More: A Critique of Positivist Formulations on Archives in South Africa” (1997, 132), Verne Harris argued that positivist ideas were embedded in archival thinking and shape it. Speaking from a South African archives context, Harris suggested that the “archival discourse in this country is dominated by a Positivist paradigm which has been dominant for a very long time and which cries out for interrogation” (Ibid, 133). He associated the positivist paradigm with the concepts of archival institutions as centralized repositories for preserving the collective memory of nations; of archives as natural byproducts of

business activities and therefore, stable, uncontested evidence of processes and actions; and of the archivist as an impartial custodian and gatekeeper of the documentary residue of the past (Ibid). Citing the works of Foucault and Derrida, Harris asserted that archivists needed to rediscover their role in the electronic era, a world in which "context is more complex and more fluid than ever before" (Ibid, 139).

Building on Harris' position, in her article entitled "'Records of Simple Truth and Precision': Photography, Archives, and the Illusion of Control" (2000, 40), Schwartz reflected on the mid-nineteenth century origins of photography, which shaped the reception of photographs as unmediated representations of reality. She highlighted discussions about the ideological origins of the French archival classification system (Moore 2000) and traditional approaches to archives based on stable and fixed records (Cook 1997) in her critique of assumptions about photographs, claiming they are "rooted in the same positivist paradigm" (Schwartz 2000, 39). By adopting a post-modernist perspective, Schwartz identified traces of positivism in the supposed archival profession's adherence to principles and practices that maintain the notion that archives are unmediated, objective and organic accumulations (Ibid, 40). She acknowledged the works of Foucault and Derrida for revealing "the archive as a problematic site of contested power" and cautioned archivists against making claims of objectivity, impartiality and truth (Ibid, 37). Schwartz observed that members of the archival community were returning to "vocabularies of truth, natural order, and control" in an attempt to solve the challenges posed by electronic records, specifically the volume, diversity and immateriality of contemporary communications (Ibid). She encouraged the archival community "to recognize that neither archival records nor archival practices are theory-free or value-free" and that solutions to the problems raised by

electronic records are to be found by recognizing paradigmatic origins and finding alternative approaches (Ibid).

Cook has written extensively on the role of archival science in the postmodern and networked world. In his recent discussion of the four archival paradigms, Cook reflects on the evolution from one paradigm to another and suggests that it does not result from a break between philosophical approaches as much as from a process of accumulation (2013). In the first archival paradigm the focus was on records as evidence, emphasizing methods of control; and in the second archival paradigm the focus was on records as memory, emphasizing methods of interpretation (Ibid, 111-112). Cook refers to the third archival paradigm as "postmodern archiving," centered upon the identity of the archivist as a "conscious mediator" with a focus on assisting society in forming its own multiple identities by providing access to archives as a societal resource and acting on behalf of others to protect evidence in the rapidly changing digital environment (Ibid, 113). Private records and personal archives, according to Cook, are part of the third archival paradigm, in which a broader conceptualization of records and archives is used in response to the increase in personal digital communications, the growing importance of audiovisual and photographic sources, and online communities.

3.4 Interpretivism and Archival Science

Archivists influenced by postmodernist views called for an expansion of existing archival theory and principles. As a result, scholarly research on archives and recordkeeping began looking at interpretivism as a means of adapting methodological approaches to the study of emerging forms of documentation, the complexity of recordkeeping systems, and changing contexts for

capturing, organizing, pluralizing and storing personal communications (Williamson 2002; McKemmish and Gilliland 2013). In their analysis of historical developments and current trends in archival and recordkeeping research, McKemmish and Gilliland (2013) discuss the interpretivist paradigm as being influenced by postmodernism and encompassing methodologies that employ strategies of qualitative data collection and analysis. They note that "interpretivist researchers focus on the contingent nature of records, the diverse and changing contexts in which they are created, managed and used, and the formative role played by recordkeepers and archivists" (Ibid, 91) and they suggest that some phenomena are more readily understood from an interpretivist viewpoint (Gilliland and McKemmish 2004, 170).

A closer look at the philosophical beliefs associated with interpretivism provides a better understanding of the paradigmatic position of interpretivism in contrast to positivism, as seen by the writers discussed above. The ***ontological assumption*** of interpretivism is relativism. Thus, there is no one objective, universal reality. Instead, reality is constructed differently by different persons through the meanings and understandings they develop socially and experientially (Guba and Lincoln 1994, 110). The ***epistemological assumption*** of interpretivism is subjectivity. Thus, the world does not exist independently of our perceived knowledge of it (Grix 2004, 83). To experience a world is to participate in it and different people may construct meaning of the same phenomenon in different ways (Crotty 1998, 9), making meaning is a social process and context specific (Willis 2007). The researcher and the research participant mutually influence and co-construct the data, which emerge from their interactions. In this manner, the findings of interpretivist research are created as the research proceeds (Guba and Lincoln 1994, 111). The ***methodological assumption*** of interpretivism is directed at understanding phenomena from an

individual's perspective and investigating interactions among individuals, as well as the cultural contexts people inhabit (Creswell 2009, 8). Inquiry is conducted using qualitative methods, through which the researcher observes or draws upon the experiences of individuals in natural settings, using methods that include open-ended questionnaires and in-depth interviews. In information systems (IS) research, interpretivist methods aim at producing an understanding of the context of the information system (Walsham 1995, 4). The ***axiological assumption*** of interpretivism is that the researcher's subjective values, intuition and biases (e.g., experiences) are brought to the study and influence interactions with research participants, as well as interpretation of the research data (Walsham 2006, 321).

The philosophical assumptions of interpretivism are well suited to the research conducted for this dissertation, the goals of which are to understand how members of a social group (i.e., members of social media platforms), through their participation in information activities and social processes (i.e., generating, organizing, sharing, and storing), enact their particular realities and endow them with meaning (Orlikowski and Baroudi 1991, 13); and to show how the beliefs and intentions of the members shape their actions and contribute to an understanding of contemporary photographic practices and their byproducts – the photographic records that exist in the context of social media platforms.

In her article entitled "Contemporary Archival Diplomatics as a Method of Inquiry: Lessons Learned from Two Research Projects," analyzing *The Protection of the Integrity of Electronic Records Project* (the UBC Project) and the *International Research on the Preservation of Authentic Records in Electronic Systems Project* (InterPARES 1 Project), MacNeil asserts that

the complexity of the digital environment and the volume and diversity of digital records require more than one method of inquiry (MacNeil 2004, 228). The interpretivist paradigm allows researchers to take a qualitative approach and select methods that will provide deep descriptions of the phenomena under study, while incorporating their own experiences and interactions in the investigation of the object of study (Ibid, 229).

This overview of some of the contemporary thinking about archives and the archival profession is intended to present a rationale for situating a study of contemporary photographic practices utilizing mobile/smartphones and social media platforms within an interpretivist approach, employing several qualitative methods for data gathering and analysis in addition to the archival method and diplomatics. In their article entitled “The Archival Method” (2015) Duranti and Michetti discuss the origins, development and nature of the archival method, defining it as a specific method of inquiry rooted in archival theory, focusing both on records as evidence of the activities generating them and on records creators as sources of information about the records. Archival theory and methodology are treated as a coherent system, in which theory guides methodology; thus, archival research conducted according to the archival method examines the phenomena and structure of records and record aggregations for understanding their administrative, functional, procedural and documentary contexts, and studies each of these contexts for authenticating records and records aggregations purposefully created within them, according to the principles belonging to the archival doctrine itself (Ibid 6). When archival scholars adopt the archival method of inquiry, they can draw upon auxiliary tools, such as diplomatic criticism, to analyze the characteristics, form, and function of new types of records in order to identify and understand record elements, attributes and relationships (Ibid, 7).

The study discussed in this dissertation is the first to ask in-depth questions about contemporary photographic practice involving mobile/smartphones and social media platforms from an archival perspective, and to explore the meanings that individuals attach to their activities and their digital photograph collections. In doing so, the research, though not archival in nature– being not guided by archival theory – aims at serving an archival purpose, that of informing the archival community about how contemporary digital photographs are being generated, used and accumulated in the online environment. In fact, by investigating the behaviours of individuals, it provides an understanding of the documentary, technological and juridical contexts in which digital photographs are being created, which will inform the archival community and future approaches to acquiring, managing and preserving digital archives shared on social media platforms. Moreover, by using multiple methods of data collection and analysis in addition to the archival method and diplomatic criticism, the approach chosen to understand and manage digital photographs generated, used and accumulated in an online environment contributes to an expansion of archival science.

3.5 Research Plan

A research design is the general plan for conducting a study (Creswell 2013, 49). It is the interconnection of worldviews, strategies of inquiry, and research methods that inform the research process. The paucity of research in the area of personal digital photographs shared and stored in social media platforms calls for a research design that is responsive to discovery and supports an in-depth exploration of emerging social phenomena. The procedural flow between the components of a research design can be linear, such as a series of steps representing a

deductive orientation towards the study, or iterative, with some components being visited more than once during the process, providing a flexibility and movement between components that supports an inductive orientation and allows for assessment and adjustments throughout the research process (Maxwell 2005, 3). The following sections address the components of the research design selected for the study of digital photographic practices involving mobile/smartphones and social media platforms, and provide a rationale for the selection. Although discussed separately, "the purposes, questions and methods of research are all interconnected and interrelated so that the study appears as a cohesive whole rather than as fragmented, isolated parts" (Creswell 2013, 50).

3.5.1 Worldview – Interpretivism

Interpretivism has its roots in the writings of nineteenth and twentieth century neo-Kantian German historians and sociologists, such as Dilthey, Simmel, and Weber, working in the human sciences (Holloway and Wheeler 2002; Schwandt 2003). The emergence of interpretivism is discussed as a response by social scientists to the dominant paradigm at that time, positivism, which informed research in the natural sciences. It was argued that the existing scientific approach to making sense of phenomena through law-governed explanations was not suited to the human sciences exploration of social phenomena, thus a different methodological approach was necessary (Schwandt 2003, 295). Weber introduced an alternative approach to understanding phenomena through a process of interpretation of an individual's actions and perceptions, which he referred to as *verstehen* (Holloway and Wheeler 2002, 7).

In the early 1970s, interpretivism was included in the larger “reformist movement” within the academic community, which critiqued social science research for being too focused on numbers rather than on the details of daily life (Schwandt 2003, 293). This criticism led to the development of qualitative inquiry conducted within an interpretivist paradigm. The ontological and epistemological assumptions of interpretivism are discussed as accepting multiple subjective realities and working with dynamic, socially constructed meanings (Kroeze 2011). In addition to the emphasis on the socially constructed nature of reality, interpretivist research acknowledges the relationship between the researcher and what is being explored, and the situational constraints shaping this process. Methodologically, interpretivism is strongly associated with qualitative research, such as ethnography and phenomenology (Goldkuhl 2012). The aim of understanding the subjective meanings of persons involved in a social process is a key aspect of the interpretivist worldview. The researcher gains knowledge of a phenomenon by interpreting the meanings that individuals involved in the activity attach to their actions.

The research for this dissertation is guided by the interpretivist worldview and employs a qualitative approach, which involves the use of qualitative data collection and analysis, and an interpretive lens to gain an in-depth understanding of an emerging phenomenon and its contexts from the perspective of individuals who participate in a shared activity. The choice of design was the result of a lengthy process that started with philosophical assumptions and moved through the statement of a research problem, the development of several open-ended research questions, and then the gathering of multiple forms of data followed by groupings to make sense of the data and to answer the questions.

The decision to take a qualitative approach to study digital photographic practices involving smartphones and social media platforms was based on the consideration that the research deals with an emerging issue that needs exploration, a problem that requires further analysis (beyond what is available in existing literature), the need for complex, detailed understanding of an event or phenomenon, and an interest in understanding the context(s) or settings in which participants engage in the activity or experience the event. Furthermore, the ubiquity of digital photographs shared online marked contemporary photographic practice as a significant method of visual communication and brought it to the attention of scholars in social science and archival science as a substantive area of investigation (Hand 2012).

3.5.2 Strategy

There are many ways to construct a qualitative research design; in fact the options are described as “baffling” (Creswell et al. 2007). Decisions will vary in regards to the weight given to existing literature in shaping the research questions and the use of theoretical deduction (Creswell 2013, 50). Additionally, the personal history of the researcher, which in this case involved professional experience as a photographer and scholarly experience in conducting research on digital photographic practices through the lens of archival science, provided an orientation to the research.

A careful examination of available knowledge and theory on the research topic was carried out through an extensive literature review. This led to the identification of the research problem – how is the use of mobile devices and social media platforms to create, share and store digital photographs introducing new social practices, technological processes and legal contexts for

record-making and recordkeeping that may impact the trustworthiness of digital photographs and future actions by archivists to preserve and provide access to personal digital archives that include social media content. The exploratory nature of the research problem influenced the use of a qualitative strategy to investigate the research topic.

The qualitative design adopted for this study was developed in three phases (see Figure 2): data collection and analysis, a second phase of data collection and analysis, and a third phase of interpretation. The primary research questions (informed by the literature review and theoretical framework) guided the first phase of data collection and analysis. The follow-up research questions (revised in response to preliminary findings from the first phase and recent literature on the topic of inquiry) guided the second phase of data collection and analysis. The research participants for the second phase of data collection were identified as an activity of the first phase.

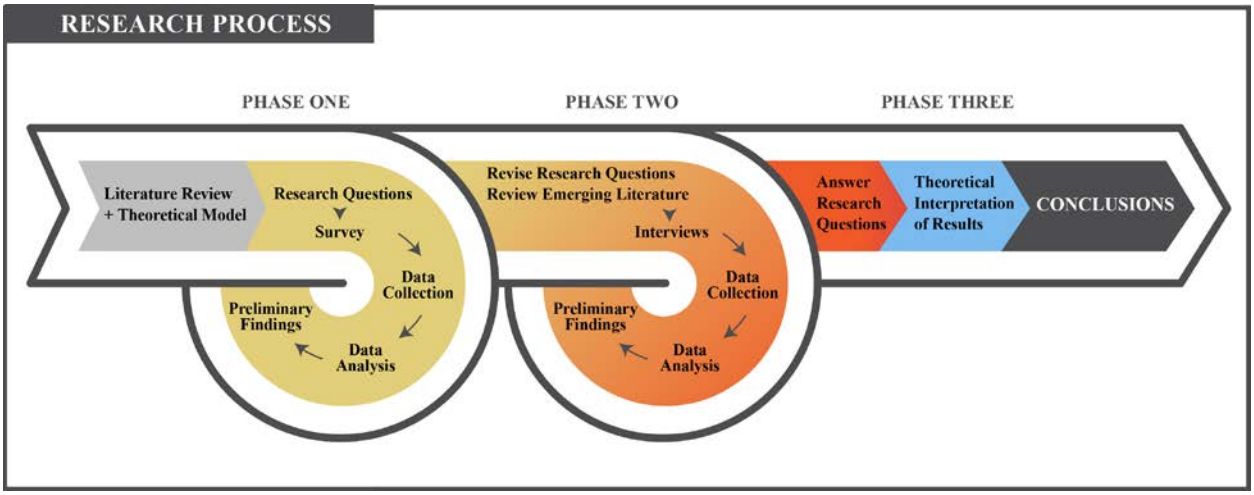

Figure 2- Research Process

The rationale for this design was that the first phase of collection of qualitative data would provide a broad description of digital photographic practices involving mobile devices and social media platforms and identify the expectations held by individuals about these processes and their online digital photographs collections, while the second phase would provide greater depth of understanding of the meanings individuals attach to contemporary photographic practices and of how digital practices differ from earlier film-based photography. The decision to review new literature on the area of investigation after the first phase of data collection and analysis was made in response to the growing interest in social media platforms as archives by scholars in the area of human computer interaction (HCI) and the legal contexts of social media platforms by government and scholars, which had not existed at the outset of the study discussed in this dissertation (Marshall and Shipman, 2014; House of Commons 2014; Rustad and Koenig 2014; Acker and Brubaker 2014; Gibbs et al. 2015). Additionally, the rapid rate of change in the services provided by social media platforms (e.g., updates to interfaces, revision of privacy policies, additional features and integration with mobile devices etc.) encouraged periodic review of the literature throughout the research process to remain open to new issues related to the area of inquiry. The third and final phase involved summary and interpretation of the research results in the context of the research questions and theoretical framework.

3.5.3 Rationale

This study used two primary methods of data collection and analysis. The first method involved collection of data through a self-administered questionnaire, and the second method involved collection of data through semi-structured interviews, to investigate issues emerging from the first data collection method in further detail. The following subsections describe the rationale for

using these two methods as part of the larger qualitative research design. Chapters 4 and 5 provide detailed methods sections including discussion of the participants and materials used during data collection and the procedures undertaken throughout data collection and analysis.

3.5.3.1 Self-administered Questionnaire

The decision to use a web-based survey to reach participants and gather data from them about their photographic practices involving smartphones and social media platforms through a self-administered questionnaire was based on careful consideration of the advantages and disadvantages. As the preliminary data gathering method in a qualitative research inquiry, the primary advantage of using a web-based survey was that the identified population of participants conducts its activities of accessing, sharing and storing their digital photographs in the online environment as members of social media communities. The purpose of the survey was to find out about the information processes (i.e., activities) with which individuals are engaged and to understand the perceptions of participants regarding ongoing access and long-term preservation of digital photographs collections shared on social media platforms. A specific objective of the survey was to identify individuals for follow-up interviews. The combination of data gathered through the self-administered questionnaire and the semi-structured interviews provided rich descriptions of the research topic.

Additional advantages of using a web-based survey with self-administered questionnaires were the efficiency of dissemination, collection and analysis, and the quick response time. These advantages are significant in the context of doctoral research conducted by an individual scholar. To gain these advantages the survey-authoring tool Qualtrics was used to build the online survey,

pilot test the questionnaire and make revisions, administer the survey in real-time, collect data and analyze the results. Qualtrics supports qualitative research related activities of reviewing responses while in-progress, performing different analysis activities on the data and on different subgroups of the data, as well as visualizing survey responses through a number of different presentation formats.

The disadvantages associated with web-based surveys relate to data collection methods and sampling issues. Self-administered questionnaires rely on the participants to provide demographic information, which may not be as accurate or reliable as data collected by researchers conducting a survey face-to-face (Dillman 2000). The membership of social media platforms is difficult to pinpoint as most of the available data is sourced from the social media service providers' marketing materials. Therefore it is difficult to accurately size the population of social media members and establish a sampling frame.

Furthermore, a limitation of web-based surveys is the potential risk of participants taking the survey more than once. Qualtrics provides a method for capturing IP addresses and associating them with specific questionnaires so that responses by the same IP address can be omitted. A participant could respond to the survey multiple times using different devices, or more than one participant could respond to the survey using the same device. Ultimately, the success of the survey method rests on the researcher's skills to construct a data-gathering tool that captures the intended characteristics and contexts of the phenomenon under study (Patton 2002, 14).

3.5.3.2 Semi-structured Interviews

The decision to use semi-structured interviews to gather detailed descriptions provided by participants about their photographic practices and the potential meanings attached to these experiences was based on careful consideration of the advantages and disadvantages. Within the interpretivist paradigm, interviewing is aimed at understanding people's experiences from their own point of view (Williamson 2002, 242). For this reason interviews present an opportunity for participants to talk about an activity or phenomenon as a substitute for the researcher's observation of the actual behavior (Silverman 2013, 131 citing Heritage 1984, 236). This presents an advantage as it allows the researcher to gather data from participants when physical observation of their activities would be impossible due to their location.

Two key issues in interpretivist approaches to interviewing are the role of context and language. The interview is "a conversation constructed jointly by a particular teller and a particular listener" (Riessman 1993, 31 cited in McCormack 2000, 287) and it occurs in a particular context that shapes its meaning. Language is the primary means of communicating in an interview and there is a process of reconstruction and reinterpretation that occurs when the participants talk about their experience of the phenomenon under study and the researcher interprets their responses represented in the interview transcripts (McCormack 2000, 286). The decision to use a variety of types of interviews: Skype-to-Skype (audio only), Skype-to-phone, and in-person in this study, was based on practicality and what would gather the most useful information to answer the research questions (Creswell 2013, 164). The in-person option was only available to participants located in British Columbia. The advantages to this approach were that some participants had a degree of flexibility in selecting the type of interview that would

make them feel the most at ease and the researcher could interview participants via Skype or phone who resided in locations outside of British Columbia. However, the potential disadvantage of this approach was that the settings for the interviews were different, a fact that could have introduced inconsistencies in the context of the interview and the relationship established between the researcher and the participant.

The semi-structured interviews incorporated an interview protocol, a form with open-ended questions based on the follow-up research questions, phrased in a way that participants could understand. The advantages of an interview protocol were that it provided structure and consistency to the interviews and was bounded by prompts and questions to encourage participants to open up and express issues emerging out of the conversation (Creswell 2013). An additional advantage of the interview protocol was the consequent ability to compare participants' responses. The use of semi-structured interviews supported a directed content analysis approach (Hsieh and Shannon 2005, 1281-1283). In the directed approach the data collection instrument includes targeted questions to prompt responses from participants, which are based on categories pre-determined by existing literature and theory and inform data analysis in a deductive manner. The analysis of interview data required transformation of the interviews into text, reading the transcripts and highlighting text using predetermined codes, as well as creating new codes upon discovery. The disadvantage of this approach involves the likelihood of influencing participant interpretation of the topic of inquiry by using probing questions in the data collection instrument.

3.6 Summary

This chapter presented the rationale for the research design that was used in the study of digital photographic practices involving mobile phones and social media platforms. The next chapter presents the first phase of data collection and analysis through a discussion of the web-based survey method, the participants, materials and procedures, followed by presentation of the results of the survey. The chapter after that presents the second phase of data collection and analysis through a discussion of the interview method, the participants, materials and procedures, followed by presentation of the results of the semi-structured interviews. The final chapter presents a synthesis of the survey and interview findings and discusses the implications for archival science, as well as providing recommendations for future research, practice and policy.

Chapter 4: Survey of Existing Practices

A web-based survey on the trustworthiness of digital photographs accessed and stored on social media platforms was conducted with 494 participants drawn from a broad range of people who use photo-sharing and social networking sites to share and store their digital photographs. The goals of the study were to gain a better understanding of the information practices of individuals, specifically, photographic practice involving mobile devices and social media platforms and to inform the design of the more in-depth interview-based study that is reported in the next chapter.

4.1 Research Questions

Four research questions were identified for the survey study. The research questions were exploratory in nature and were intended to address a range of related issues. The research questions for the survey study will be discussed in terms of their goals, as well as their relationship to the survey questionnaire.

The first research question in this dissertation was: What is the primary purpose that individuals are using photo-sharing and social networking sites for, in regards to their digital photographs? The goal of this research question (SG1) was to explore the nature of digital photographic practice involving social media platforms and to identify the activities involved, as well as the features of the services that support these activities. This research question informed survey questions 7 through 10 (the full survey questionnaire is provided in Appendix C).

The second research question in this dissertation was: Are individuals who use photo-sharing and social networking services to store their digital photographs concerned with trustworthiness (i.e.,

authenticity, reliability and accuracy)? The goal of this research question (SG2) was to explore the activities undertaken by individuals to establish the ‘who, what, where, when and why’ of the digital photograph and to protect the content of the digital photograph and its context of creation and use from unauthorized and unintended changes. This research question informed survey questions 11 through 17. In order to explore the issue of reliability, the survey questions ask participants about procedures over creation and adding information to identify the photographer and persons contributing to the creation of the photograph. In order to explore the issue of authenticity, the survey questions ask participants about adding information that contributes to the identity and integrity of the digital photograph, as well as procedures aimed at controlling who can access digital photographs.

The third research question in this dissertation was: Are individuals aware of the risks posed by social media platforms to the trustworthiness of their digital photographs collections? The goal of this research question (SG3) was to explore activities undertaken by individuals to download digital photographs out of social media platforms and to identify any issues that could impact the trustworthiness of digital photographs. This research question informed survey questions 18 and 19. In order to explore the issue of trustworthiness, the survey questions ask participants about activities of downloading photographs out of social media platforms and their experience with issues that impact reliability (e.g., removal of photographer name from metadata); impact authenticity (e.g., removal of metadata that contributes to identity and integrity); and impact accuracy (e.g., changes in the size, shape and/or colour of the photograph and corruption of the image file).

The fourth research question in this dissertation was: Are individuals who use photo-sharing and social networking sites aware of the challenges presented by social media platforms to continuing access and long-term preservation of digital photographs collections? The goal of this research question (SG4) was to explore the preservation activities undertaken by individuals, and to understand the degree to which individuals are aware of social media service providers' policies and procedures for managing user-generated content shared and stored with their service. This research question informed survey questions 20 through 29. The survey questions ask participants about procedures for managing and storing digital photographs, which contribute towards establishing trustworthy records, such as designating an original photograph and its copies, protecting against accidental deletion of accounts and photograph collections and designating a trusted custodian to oversee stewardship of personal photograph collections stored online in the case of death.

4.2 Pilot Testing

The survey structure (e.g., flow, question skip, etc.) and questions were tested with 10 pilot participants over the course of 2 weeks. The wording for some questions was revised based on responses by pilot participants and an estimate for the length of time required to complete the survey was obtained.

4.3 Method

The survey was conducted over a two-month period using a web-based tool. Participants were recruited from a variety of groups that were considered to be relevant to the research questions.

4.3.1 Participants

A purposeful sampling strategy was used for the survey. Participants were selected so they could "purposefully inform an understanding of the research problem and the central phenomenon in the study" (Creswell 2013, 156). The study sought individuals with experience in accessing and storing digital photographs on social media platforms, specifically individuals who were nineteen years of age and older (legally adults in British Columbia) and able to communicate in English. An invitation to participate in the web-based survey was posted to photo-sharing and social networking sites, professional photography listservs and Amazon Mechanical Turk, an online crowdsourcing service that allows researchers to post tasks that individuals can complete for payment. Additionally, two online articles written by others about the research project included an invitation to participate in the survey. An annotated list describing the venues and the postings can be found in Appendix B. The invitations included a link to the self-administered web-based questionnaire used for the survey. The survey was available for two months, April 14, 2014 through June 14, 2014, during which time data collection was conducted.

The web-based survey received 612 responses, 515 of which were complete (83.9%). Responses for incomplete surveys were not considered, nor were responses with duplicate IP addresses (21). The remaining 494 complete responses were used to determine the results of the survey. The survey participants were distributed among twenty-two countries, with the majority located in North America, 117 in Canada and 199 in the United States. Ages ranged from 19 years old to over 70 years old. Informed consent was obtained from all participants. There were 205 participants recruited through Mechanical Turk, each were paid seventy-five cents.

4.3.2 Materials

The questionnaire was administered online using Qualtrics software, a web-survey tool provided by the Faculty of Arts at the University of British Columbia. Qualtrics is a private research software company based in Utah, U.S.A. The University of British Columbia has approved the tool for the collection of non-sensitive research data. In addition to an initial question that verified consent of the participant and three final questions that asked about a participant's interest in receiving follow up information, participating in a subsequent interview study, and confirming submission of the responses, the questionnaire contained a total of thirty questions (two questions followed that provided participants the option of receiving a summary of the survey results and volunteering to participate in a follow-up interview). All the questions were not answered by every participant; some questions were contingent upon a previous answer, which required incorporating skip logic into the design of the survey. For example, if participants identified their membership in social media services as free, they were asked a follow-up question about their willingness to pay for a membership if free accounts were no-longer available, but if participants identified their membership type as paid, the survey software automatically skipped over the question about willingness to pay for memberships and continued on to the next question, which every participant was asked, about the length of time they had held their membership. This meant that some participants answered fewer than thirty questions. The software automatically provided skip functionality to reduce the chance of participant error.

A variety of question types were used in the questionnaire, including multiple choice and free-form text entry (used only to provide alternative or supplementary answers when the choices provided were insufficient), providing data that were categorized after collection. The full

questionnaire is provided in Appendix C. The estimated time for completion of the questionnaire was 10-15 minutes. This estimate was based on the results of pilot testing the web-based survey.

4.3.3 Procedure

Individuals interested in participating in the study were required to click on the URL link provided in the invitation they received, or came across, as in the case of published articles and Mechanical Turk, which directed them to the web-based survey. The questionnaire was preceded by an explanation of the purpose of the research, the procedure for administration and data gathering through Qualtrics, and the confidentiality, potential risks, contacts for information about the study, and contacts for concerns about the rights of research participants related to the study.

Prior to commencing the questionnaire, individuals were asked to indicate their willingness to participate in the survey by clicking on a button marked “ACCEPT” or to decline to participate in the survey by clicking on a button marked “DECLINE.” At the end of the questionnaire, participants were asked if they wished to receive further information about the study and if they were interested in participating in a follow-up interview study. They were then required to complete the survey by clicking on a button marked “SUBMIT.”

The duration of the survey was recorded and the data was collected. The minimum time taken to complete the survey was 1 minute 53 seconds and the maximum time taken was 56 hours 57 minutes. Of the 494 participants, the average time it took participants to take the survey was 27 minutes 43 seconds (*SD* = 210 minutes 14 seconds). A possible explanation for the longer

durations is that some participants may have started the survey and left it open while doing other things, returning to complete the survey later. The median was 6 minutes 31 seconds and the mode was 4 minutes 33 seconds and 5 minutes 50 seconds.

4.4 Results

The pilot test results and incomplete results from the survey were removed from the dataset. Of the 602 surveys that were submitted after piloting, 515 were complete (all required questions were answered) and 494 were selected. The researcher analyzed the responses through a process of reduction, display and conclusion drawing.

4.4.1 Data Preparation

Survey participants were required to answer all questions they were asked; otherwise the survey software would not advance to the next question. A survey was deemed incomplete if the participant did not click on the submit button at the end of the questionnaire. Using tools provided by Qualtrics and Microsoft Excel, data were organized and displayed as tables, graphs and charts to support analysis and draw preliminary conclusions. These are available in Appendix D. A second round of analysis was then conducted, in which the research questions acted as categories to organize data and draw further conclusions, and a third round of analysis drew conclusions that incorporated emergent categories in the data and narrative responses.

4.4.2 Age Range

In the first question, survey participants were asked to select their age range from a provided list (Table 1).

Distribution of Participant's Age		
Age	**Count**	**%**
19-29	185	37.4
30-39	154	31.2
40-49	89	18.0
50-59	46	9.3
60-69	17	3.4
70 & Older	3	0.6
Total	494	100.0

Table 1 - Distribution of Participants' Age

4.4.3 Types of Photo-sharing and Social Networking Accounts

One of the objectives of the survey was to discover how individuals currently use social media platforms in their photographic practice. Survey participants were asked questions about which social media platforms they use, how long they have been members of social media sites and the types of accounts they hold with those services, as well as the nature of their photographic practice and the type of photography they conduct on social media platforms.

In Q.2 survey participants were asked to identify which photo-sharing and social networking services they use from a list. The majority of survey participants (90.9%) reported that they use Facebook. The other services that are used the most by survey participants (in descending order) are Twitter (46.4%), Dropbox (39.3%) and Instagram (36.8%). The responses to this question reveal that the majority of survey respondents (83%) had accounts with more than one social media provider and share digital photographs across a number of different social media services. Of the minority of survey respondents (17%) holding only one social media account, over eighty percent are members of Facebook.

Distribution of social media platforms by age group shows that Snapchat accounts are more common among younger participants (Table 2). This is expected as the photo-sharing service enables ephemeral photographic practices, in which the digital image is deleted from an individual's mobile phone ten seconds after viewing. Comparison of Flickr and Instagram accounts by age group suggests that younger participants prefer Instagram for photo-sharing; whereas, older participants prefer Flickr. Instagram (a brand name inspired by instant Polaroids and the telegram service) is a photo-centric social media platform that caters to smartphone users, providing on-the-fly image-editing tools (e.g., filters) and using hashtags and comments for social metadata; whereas, Flickr is an older photo-sharing site that initially did not provide support for mobile phone uploads, catering more to serious amateurs using dedicated digital cameras (e.g., DSLR) to share images online, as well as critique and support other Flickr members. Flickr provides keywords and comments as social metadata, but it also presents Exif metadata embedded in each image. As a result, Instagram is associated with spontaneous sharing and Flickr is associated with storage, which may explain younger participants' preference for Instagram.

Social Media Platforms by Age Group										
	Flickr	Instagram	Facebook	Twitter	Dropbox	Snapchat	Google+	iCloud Photostream	Other	Total
19-29	54	70	170	90	61	29	71	25	20	185
30-39	50	62	146	70	57	12	42	17	10	154
40-49	36	29	78	38	41	0	27	16	11	89
50-59	19	17	41	25	25	4	16	13	9	46
60-69	7	4	13	6	8	0	3	1	3	17
70 – over	0	0	1	0	2	0	1	1	0	3
Total	166	182	449	229	194	45	160	73	53	494

Table 2 - Social Media Platforms by Age Group

In Q.5 survey participants were asked to identify the duration of their memberships with existing social media providers. The majority of responses were from two groups of individuals, those holding memberships from 6-10 years (47.0%) and those holding memberships from 2-5 years (45.1%). Outliers held memberships from 11-15 years (5.1%) or less than one year (2.8%). These responses can be considered in the context of launch dates for social media platforms: Friendster in 2002 (twelve years prior to the study), LinkedIn in 2003 (eleven years prior to the study), Facebook in 2004 (ten years prior to the study), Twitter in 2006 (eight years prior to the study), Dropbox in 2008 (six years prior to the study), and Instagram in 2010 (four years prior to the study).

In Q.3 survey participants were asked to identify which types of accounts they held. The majority (82.2%) reported holding free accounts and not paying for any social media services. In response to whether they would pay for their existing accounts if free accounts became unavailable, only fourteen percent of those survey participants reported that they would be willing to pay. A significantly smaller percentage of survey participants (16.0%) held both free accounts and paid accounts, and even fewer survey participants (1.8%) held only paid accounts.

In Q.7 survey participants were asked to describe their photographic practice according to purpose – professional, amateur or both. The majority of survey participants (66.4%) reported their practice as amateur. The survey participants who identified their practice as professional were in the minority (13.0%). However, a slightly larger percentage of survey respondents (18.8%) considered their photographic practice to be both professional and amateur. Related to Q.7, but different, in Q. 8 survey participants were asked to identify their use of photo-sharing

and social networking sites in regards to their photographic practice. The majority of survey participants (60.3%) reported that they use social media services for personal photography. Only a very small percentage of survey participants (3.2%) reported to use social media services for strictly business purposes. Based on the earlier question, it was expected that a higher percentage of survey participants (36.2%) would identify their use of social media services for the purpose of sharing business and personal photographs. Distribution of uses by photographic practice suggests that survey participants are primarily using social media platforms as part of their amateur photographic practice with the goal of sharing personal photographs with others (Table 3).

Distribution of Uses by Photographic Practice					
	Business	Personal	Both	Other	Total
Professional	7	20	37	0	64
Amateur	4	241	82	1	328
Both	5	33	55	0	93
Other	0	4	5	0	9
Total	16	298	179	1	494

Table 3 - Distribution of Uses by Photographic Practice

4.4.4 Activities

As part of the exploration of how individuals are using social media platforms in their photographic practice, the survey participants were asked questions about the types of devices and activities involved in their photographic practice. The activities were categorized as generating, managing, sharing and storing digital photographs collections.

In Q.6 survey participants were asked to identify the frequency with which they used dedicated digital cameras, mobile/smartphones, tablets/iPads and personal computers to capture their digital photographs. The device that survey participants reported they used the most often was their mobile/smartphone. In order of decreasing frequency, survey participants also used digital cameras, laptops/computers and iPads/tablets.

In Q.9 survey participants were asked to select from a list their primary activity when using photo-sharing and social networking services as part of their photographic practice. The majority of survey participants (71.1%) reported that they primarily use social media services for sharing their photographs with others. The activities of accessing the digital photographs of others (10.7%), managing and organizing their own digital photographs (9.3%) and storing their digital photographs (8.3%) were significantly less represented in the survey results. One survey participant commented on the seamlessness of photographic activities across various devices and social media platforms: *"I don't separate these activities in my mind – taking and sharing a photo is a way to perform and manage memory and participate in a community of others doing the same"* (R_248).

In Q.10 survey participants were asked to rate the importance of certain features of social media platforms, nearly half of all survey participants (49.3%) reported that features supporting the sharing of images are *very important*. Features supporting other activities that were mentioned but not considered as important were, listed in order of decreasing importance, accessing, managing and storing images.

Many social media platforms provide members with the option of adding information to their digital photographs after posting to the service. The information is usually presented in the form of comments, hashtags, likes, ratings and tagging people represented in the image. In Q.15 survey participants were asked if they add this type of information to their digital photographs after uploading them to photo-sharing and social networking sites. The majority (75.5%) reported that they add tags, comments, likes and/or ratings to their digital photographs after uploading them to social media platforms. Several survey participants described their practice of adding social metadata to digital photographs shared on social media platforms as dependent upon the intent or purpose behind sharing the image and the degree to which the information contributes to the reception of the photo. Furthermore, these activities of associating information (i.e., social metadata) to digital photographs assist in identification and discovery of digital photographs when shared on social media platforms: *"Tags, yes, so I can locate them [images] faster"* (R_37).

In Q.20 survey participants were asked about activities related to posting images to social media platforms, specifically, whether they kept a copy of their uploaded digital photographs somewhere else. The majority of survey participants (92.3%) reported that they keep a copy of their digital photographs on another device. Q.22 survey participants were asked to rate how often they used certain devices, (e.g., mobile/smartphone, laptop, external hard drive), storage services (e.g., cloud storage) and storage media (e.g., DVD) to store copies of their digital photographs. Nearly half of the survey participants (46.7%) reported that they *always* use personal computers/laptops for storing copies of their digital photographs. In order of decreasing frequency of use, they keep copies of digital photographs on external hard drives and their

mobile/smartphones. The frequency of storing photographs collections with cloud storage services and on DVDs is significantly less.

4.4.5 Controls Over Unauthorized Access and Reuse

One of the objectives of the survey was to understand whether individuals using social media platforms as part of their photographic practice were concerned about unauthorized access and reuse of their digital photographs while shared and stored with the platform. The survey participants were asked questions about controlling access to their digital photographs on social media platforms, the nature of their concerns, and the types of activities undertaken before and after upload that may or may not contribute to controlling unauthorized access and use.

In Q.11 survey participants were asked if they controlled access and use of their digital photographs that were stored on photo-sharing and social networking services. The majority (84.8%) reported that they do control who can access and use their digital photographs stored on social media platforms. In Q.12, a follow-up question asked those survey participants who do control access, to rate the importance (from not at all important to very important) of specific reasons for doing so, including personal privacy, privacy of others, copyright, licensing, and business. Nearly half the survey participants (43.4%) rated personal privacy (e.g., you are in the image) as *very important* when considering control over access and use of digital photographs. The privacy of others (e.g., other people in the image) was rated higher than licensing (e.g. not wanting social media service providers to license the use of their images for monetization), and both were rated higher than copyright as reasons for controlling access to digital photographs collections stored on social media platforms.

In Q.13 survey participants were asked if they added information about the creation of their digital photographs (i.e., image metadata) prior to uploading their files. In an effort to clarify terminology, they were given examples of image metadata, such as who took the photograph, when was the photograph taken, or where was the photograph taken. The survey participants were divided almost equally: forty-six percent of survey participants reported that they do not add metadata to their digital photographs and forty-four percent reported that they do add metadata. A small percentage of additional survey participants (7.7%) provided comments that revealed the influence of the platform in determining if metadata would be added to a digital photograph prior to posting it to social media platforms. For example, *"It depends on the platform. Yes for Flickr. Sometimes for Twitter and Facebook. Never for iCloud"* (R_236).

Participants' comments also explained that the practice of adding metadata to digital image files may be supported by the digital capture device used, such as an iPhone automatically embedding location data (GPS) into the digital image file. Three participants provided comments that described removing metadata prior to upload. One comment in particular revealed a practice of that involved adding information to the digital photograph in the social media platform, but removing information embedded in the digital image file, *"I typically add descriptive information about the photo itself in service-specific metadata (e.g., Flickr tags), but strip identifying information and geotags from the file metadata itself"* (R_272). This practice relies on the social media service to manage image and metadata as opposed to embedding the metadata into the digital image file.

In Q.14, those survey participants who provided responses of “yes” (44.7%) or “other” (7.7%) to adding information to their digital photographs, were asked in Q.13 to rate the importance of adding specific types of identifying information to their digital photographs, that is, name of photographer, title of photograph, place where photograph was taken, date of photograph, and subject of photograph. Over one-third of survey participants who were asked (32.4%) rated the name of the photographer as *very important* information to capture; yet, when the full range of responses are considered (from not at all important to very important) the place where a photograph is taken had the highest overall rating. This response was expected, considering most mobile/smartphones automatically capture geographic location and populate the image’s technical image metadata (i.e., Exif metadata) with a geo tag.

In Q.16 survey participants were asked if they used watermarks, copyright symbols, or creative commons licenses to control how people use their digital photographs shared through photo-sharing and social networking services. The majority (71.5%) reported that they do not. The responses provided by the small percentage of participants (3.6%) that selected “other,” emphasize the purpose of the image (e.g., business or personal) and the platform (e.g., photo-sharing or social networking site) as factors in determining if watermarks or copyright information is added to the digital photograph.

4.4.6 Risks to Photographs

One of the objectives of the survey was to understand the degree to which individuals are aware of the risks presented by social media platforms to the trustworthiness of their digital photographs collections. The survey participants were asked questions about downloading

collections of digital photographs out of social media platforms, their experiences with accidental alterations or changes to digital photographs during management and preservation activities, and the volume of digital photographs shared and stored on social media platforms.

In Q.17 survey participants were asked if they had ever downloaded the digital photographs stored in their photo-sharing and/or social networking accounts. The majority (70.0%) reported that they had downloaded their digital photographs held on social media platforms. Those participants who had downloaded images were asked a follow-up question. In Q.18 survey participants were asked whether they had experienced any issues. The majority (79.5%) reported that they had not; but nearly one-quarter (20.5%) reported that they had.

In Q.19 survey participants who had experienced issues when downloading their digital photographs held on social media platforms were asked to select the type of issue(s) from a list, which included unexpected size and colour changes, missing files, missing image metadata, tags, comments or copyright information, corrupt files and bandwidth problems. The combination of issues selected from the list and additional comments provided by the survey participants reveal that it is common for downloaded image files to be a different size and colour than the original file uploaded to social media platforms. However, as one survey participant explained through an additional comment, these types of changes are not unexpected, as social media platforms transform the quality of the uploaded digital image file to a lower resolution for sharing purposes. Of the survey participants who experienced issues (20.5%), over one-third reported downloading image files that were missing identity metadata (39.4%), copyright information

(33.8%) and comments, tags, likes and ratings (32.4%). In other cases (35.2%) files were corrupt and could not be opened.

To understand the scope of these risks, in Q.23 survey participants were asked about the number of digital photographs they have stored with photo-sharing and social networking services. One-quarter of survey participants (25.9%) reported storing 101-500 digital photographs; a lesser number of survey participants (22.5%) reported storing 501-1,000 digital photographs; and nearly one-quarter of survey participants (24.3%) reported storing 1,000-5,000 digital photographs in social media platforms.

Outliers were identified with smaller collections of 1-100 digital photographs (12.8%), and larger collections of 5,001-10,000 digital photographs (7.9%). There were less than a handful of participants (0.8%) with extremely large collections of 101,000 and over. Of the four survey participants who reported upwards of 101,000 digital photographs stored with social media services, one participant had experienced missing metadata, copyright information and comments and tags after downloading digital image files from social media services (See Table 4). The significance of unexpected issues due to management procedures of social media platforms increases with the volume of images held within online accounts.

Distribution of Download Issues by Collection Quantity			
Digital Photographs	Yes	No	Total
1-100	6	25	31
101-500	17	70	87
501-1000	15	70	85
1001-5000	22	71	93
5,001-10,000	5	19	24
10,001-50,000	4	12	16
50,001-100,000	1	5	6
101,000 ≥	1	3	4
Total	71	275	346

Table 4 - Distribution of Download Issues by Collection Quantity

4.4.7 Awareness of Challenges to Ongoing Access

As part of the exploration of the chalenges presented by social media platforms to continuing access and long-term preservation of digital photographs collections, survey participants were asked questions about social media providers' policies and procedures for account termination and restoration, as well as participants' expectations of ongoing access to accounts, and steps towards ensuring future access to digital photographs collections held in social media platforms in the case of death.

In Q.24 survey participants were asked if they had read the social media providers' Terms of Use (TOU) prior to signing-up for an account. Less than one-quarter of survey participants (19.8%)

reported actually reading the TOU before giving their consent (e.g., click to agree) and receiving a photo-sharing and/or social networking account. More than half of the survey participants (59.5%) reported that they had sort of read the terms (e.g., skimmed quickly) and a smaller number of survey participants (20.6%) reported that they had not read the terms at all.

As a follow-up, Q.25 asked those survey participants who had reported reading (19.8%) and skimming (59.5%) the providers' TOU prior to joining the service whether they remembered particular policies or sections. A list was provided to survey participants, which included Terms of Service (e.g., rules that you must agree to, in order to use the service), Privacy Policy (e.g., explanation of how the service gathers, uses, discloses and manages customer data), Copyright and Intellectual Property (e.g., explanation of who owns the content posted to the service), Rights of Others (e.g., rules against posting content that violates or infringes the rights of others), and Advertisers (e.g., explanation of how the service uses customer content for advertising activities). Of the 392 survey participants who reported reading or skimming TOU, just over three-quarters of those participants (76.5%) recalled reading the Privacy Policy and just under three-quarters (73.9%) recalled the Terms of Service. The next most significant section was the Copyright and Intellectual Property Policy, in which just over half of survey participants (52.9%) recalling reading it. These results were expected in light of the protection of privacy concerns that participants shared in Q.12 as their primary reasons for controlling access to digital photographs collections.

In Q.29 survey participants were asked about their expectations of access to digital photographs shared on social media platforms. A range of years was provided as a list (along with the

optional, “I don’t know”). Nearly one-third of survey participants (32.0%) reported that they did not know how long they would have access to their digital photographs collections stored on social media platforms. The next significant expectation of access was 20 years in the future, which was selected by seventeen percent (17.0%) of all survey participants. The distribution of expectations by years of membership suggests that participants who have held social media accounts the longest (11-15 yrs.) expect longer durations of access than other participants who have held accounts for shorter periods of time (Table 5). Expectations of accessing digital photographs ten or more years in the future are held by nearly half (48.0%) of participants with accounts 11-15 years; whereas, one-third (31.8%) of participants with accounts 6-10 years and even fewer (18.8%) of participants with accounts 2-5 years share those same expectations. Survey participants holding accounts for 1 year or less do not expect access beyond ten years.

Distribution of Expectations by Years of Membership								
	Expect less than 1 yr.	1-3 yrs.	4-6 yrs.	7-10 yrs.	10-20 yrs.	More than 20 yrs.	I don't know	Total
1 yr. or less	7	3	0	1	0	0	3	14
2-5 yrs.	11	52	31	15	17	25	72	223
6-10 yrs.	6	14	35	25	25	49	78	232
11-15 yrs.	2	3	3	0	2	10	5	25
Total	26	72	69	41	44	84	158	494

Table 5 - Distribution of Expectations by Years of Membership

In Q.26 survey participants were asked if they had ever had an account deleted by a social media service provider due to inactivity or by accident. The majority of survey participants (93.5%) reported that they had not. As a follow-up, in Q.27 the small number of survey participants (6.5%) who had experienced an account being deleted by a service provider, the majority of participants (65.6%) was successful in getting the deleted account (and its contents) restored after contacting the social media service provider.

The correlation between deletion of accounts and participants' expectation of ongoing access shows that forty-percent of individuals (43.7%) who had their account deleted expect to have access to their accounts for a duration of 1-3 years; whereas, thirty-percent of individuals (33.7%) who had no experience with deleted accounts do not know what to expect in regards to ongoing access (Table 6).

Distribution of Expectations by Account Deletion								
	Less than 1 yr.	1-3 yrs.	4-6 yrs.	7-10 yrs.	10-20 yrs.	More than 20 yrs.	I don't know	Total
Yes	5	14	5	1	1	4	2	32
No	21	58	64	40	43	80	156	462
Total	26	72	69	41	44	84	158	494

Table 6 - Distribution of Expectations by Account Deletion

In Q.30 survey participants were asked if they had made a list of their social media accounts and passwords, and/or designated a beneficiary to control deletion or preservation of their digital photographs stored on social media platforms in the case of death. The majority of survey participants (81.4%) reported that they had not made lists or designated a beneficiary. Comments provided by participants reveal a reliance on spouses to intuitively know passwords.

4.5 Discussion

At the outset of the survey study, four goals (SG1, SG2, SG3, and SG4) were identified based on the research questions. The following discussion addresses these goals and the patterns that have emerged from the survey data.

The **first goal (SG1)** was to explore the nature of digital photographic practice involving social media platforms and to identify the activities involved, as well as the features of the services that support these activities.

The survey findings reveal that individuals are typically members of *multiple* social media communities, holding free accounts with different photo-sharing and social networking service providers. This suggests that for many individuals, their digital photographs collections are dispersed across a number of different services. Participants provided comments throughout the survey that explained the factors contributing to their decision to use a particular platform for their photographic practice. These factors were based on the intent, or purpose of the photograph (e.g., business or personal), the audience associated with a particular social media platform and the features made available in the platform for supporting different activities.

Facebook accounts are by far the most represented amongst all survey participants, including those participants who hold only one social media account. Of the different platforms available, Facebook offers the widest range of features to support sharing activities, is used for both business and personal purposes and has the largest online community membership. Analysis of social media memberships in terms of age group suggests that younger participants belong to

services with features that support the ephemeral characteristics of digital photographic practice (e.g., Snapchat); whereas, older participants hold accounts with platforms that emphasize permanence (e.g., Flickr). In comments made by participants in the survey study, there appears to be a distinction drawn between photo-sharing sites and social networking sites, in which the former have features that support storage, controls over access and reuse; whereas, the latter support sharing, and have fewer controls over access and reuse.

Most survey participants hold free accounts and many would be unwilling to pay for social media accounts if the service provider changed their terms and free accounts were no longer available. Social media service providers' policies are different for members that hold paid accounts than for those members with free accounts. Specifically the terms regarding storage and backup of accounts, and the costs of restoring accounts and content in the event of account termination. It is unclear if the lack of willingness to pay for services is simply due to the fact that most survey participants are using social media platforms to share personal photography; therefore, the expectation is that the service should be free. Or if survey participants are unaware of the vulnerability of free accounts in the event of a service provider changing their terms of service. Alternatively, expectations of free social media services may reflect the length of time individuals have held their social media accounts. Most of the survey participants were clustered into two groups, those that had held accounts for 2-5 years and those that had held accounts for 6-10 years. Unfortunately the design of the survey question does not provide enough accuracy to determine if individuals have been members of one particular social media service continuously or different services. The former could suggest that through experience, individuals have gained confidence in the reliability of a particular social media service, and therefore have high

expectations for continued free services. The latter could suggest that social media members with free accounts move from service to service, seeking social media platforms that offer the most features for free.

In the context of this survey, the primary reason that individuals use social media platforms is to share digital photographs. As a result, the features of social media services that support sharing are the most important to members, followed by access and lastly, management and storage. At this stage in the study, the photographic activities of individuals are broadly understood as involving capture of images with digital devices and sharing of image collections on social media platforms. At some point in this process, nearly all the participants store a copy of their digital photographs. The most frequently used device for storing copies of digital photographs collections is the personal computer. External hard drives are used very often, followed closely by smartphones. The practice of storing images on smartphones presents a risk to the longevity of digital photographs collections as these devices are transported everywhere, easily lost and require ongoing upgrades to both the hardware and the software. However, the practice of storing copies of digital photographs on personal devices does provide a repository of digital photographs that may be shared and held on social media platforms. The difference being that the collections stored on personal devices are under the control of the creator.

The least frequently used methods are storing copies of digital photographs on the Cloud and DVD, which may reflect the fact that the Cloud is a relatively new method of storage for individuals; whereas, DVDs are an older method, but one which provides limited storage and access. A few participants provided comments that indicate inconsistent practices of storing

digital photographs prior to sharing them on social media "sometimes." Other participants reveal that motivations for storing/keeping a digital image file are balanced by consideration of the long-term value of the image: *"Most of the time yes [I keep copies]. Sometimes if I take a photo to tell a story, the image itself isn't actually important enough to me to want to save it. For example, look at the mess my kids made of the living room today"* (R_120).

It is important to take into consideration the volume of digital photographs being generated, shared and stored by individuals. Nearly one-quarter of participants reported having 1,001-5000 digital photographs stored in social media services; whereas, four participants store upwards of 101,000 images online. These are collections of magnitude that are potentially vulnerable to loss if they remain stored with social media services. Secondly, the information gathered in the survey regarding participants' practices of storing copies of digital collections on personal devices results in large repositories of born-digital image files that may challenge existing management activities of individuals and present an obstacle to access and retrieval. More needs to be known about participants' management activities, which are addressed in the next section.

The **second goal (SG2)** was to explore the activities undertaken by individuals to establish the 'who, what, where, when and why' of the digital photograph and to protect the content of the digital photograph and its context of creation and use from unauthorized and unintended changes.

The survey findings reveal that some individuals add information to their digital photographs prior to uploading them onto social media platforms, but the practice is not widespread (less than

half of participants reported adding image metadata). Professional photojournalists have been adding metadata to images since the 1990s, including additional information such as captions and copyright information, but it is not expected of amateur photographers sharing personal photography. Therefore, this result was higher than expected, considering the small number of survey participants with professional practices and sharing digital photographs for business purposes.

The information being captured by participants does establish where the digital photograph was taken, who took it, the date and the context of the event, which is provided by the subject and in a title. Participants' comments about their activities of adding and removing metadata prior to and after upload into social media platforms suggest that creators are thinking about metadata and the way it can be used to tell more about the content and context of an image. One approach to protecting the context of the creation of a digital photograph is to add information about the person who created the image, the date it was taken etc., which identifies the circumstances of its creation and asserts a degree of ownership or claim over the image and its future use.

One survey respondent who conducts both a professional and personal photographic practice and uses social media platforms to share business and personal photographs commented on the potential for metadata to be removed by social media services. *"If I remember [to add metadata], but most sites strip metadata anyways. I put watermarks on some"* (R_242). Alternatively, several survey participants provided comments that describe actions of removing metadata before posting to social media services, as a method of controlling access and reuse. The practice of removing metadata, specifically global positioning system (GPS) data that is

automatically captured by mobile/smartphones and embedded into the image file header is discussed in photojournalism literature as a method of anonymizing the photographer responsible for the image and potentially protecting the persons represented in the image from being linked to a specific location or event. Suggesting that practices of adding metadata and removing it are complex and contingent upon both the context of creation and use.

One approach to protecting photographs from unauthorized changes is to control access to them. Nearly every participant reported that they control who can access and use their digital photographs shared on social media platforms. However, the addition of social metadata is considered by some social media services to be a form of sharing and can transform a private photograph into a public one; enabling the social media provider to license its reuse for commercial purposes. The top reasons for controlling access are to protect personal privacy and to protect the privacy of others who may be represented as subjects in the image. As the majority of participants use social media platforms to share their personal photographs this response makes sense. In contrast to photographs created for the purpose of business, personal photographs belong to the person who created them and they concern the private life, relationships and emotions of a particular person. The introduction of the camera-phone and connectivity with photo-sharing and social networking services has created an opportunity for personal photographs to be shared publicly, both intentionally and unintentionally, raising a number of issues. In the context of this study, the perceptions of ownership and privacy of digital photographs collections shared and stored on social media platforms are necessary for considering approaches to their preservation.

The activity of adding comments, likes, ratings and/or tags (referring to hashtags and tagging images with the names of people represented as subjects in the images) is another approach to controlling the access and reuse of digital photographs shared on social media platforms. The majority of survey participants engage in the activity of adding social metadata to their digital photographs, through features available on photo-sharing and social networking sites. Unlike standardized technical metadata (Exif) and descriptive metadata (IPTC), social metadata are associated with the digital photograph through the social media application, not embedded in the image file header. As a result, social metadata are neither permanently linked to the digital image nor interoperable across systems. Additional responses provided by survey participants about their social metadata activities suggest that for some individuals the decision to add comments or tags is dependent upon the content of the digital photograph and the purpose for sharing it.

A third approach to controlling access and reuse of digital photographs, involves embedding information into the digital file (e.g., copyrights), encrypting the image file (e.g., watermark) and/or associating digital photographs with standardized licensing information (e.g., Creative Commons), which is possible through some social media services. The majority of participants don’t use these methods. This result was expected; as these methods arose from professional photographic practices, in which the intention is to control reuse of digital photographs, not impede access, which is the preferred form of control in regards to protecting privacy. Several comments provided by participants suggest disseminating low-resolution copies of digital photographs on social media platforms. Again, this method limits reuse, but not access.

The **third goal (SG3)** was to explore the activities undertaken by individuals to download digital photographs out of social media platforms and to identify any issues that could impact the trustworthiness of digital photographs.

The survey findings reveal that most participants have downloaded their digital photographs from social media platforms and did not experience any issues. There were a small number of participants that downloaded their digital photographs and experienced issues. An examination of the issues reveals that they indeed impact the trustworthiness (i.e., reliability, accuracy and authenticity) of digital photographs. The most reported issues were changes to size and colour of downloaded image files. These are important elements in accurately representing a photograph, expressing the intention of the creator and enabling the photograph to convey the same meaning it was intended to convey by its creator, thus their alteration impacts both the accuracy and authenticity of a digital photograph. The next most reported issues were missing metadata (e.g., photographer name, title, date, etc.). Again, these are important elements that establish the reliability of the image through identifying who took the photograph and for what purpose, and contribute to authenticity by identifying the context of creation. The removal of these elements impacts the reliability and authenticity of a digital photograph. Closely related is the removal of social metadata (e.g., comments, tags) and copyright information, both of which were reported by participants. Social metadata and copyright information contribute to authenticity by identifying the context of use. The removal of these elements impacts the authenticity of a digital photograph. These results were somewhat expected, the issue of social media platforms stripping-out metadata from digital image file headers was discussed previously in the literature review in regards to the International Press Telecommunications Council (IPTC) Photo Metadata

Working Group's Social Media Sites Photo Metadata Tests <http://www.embeddedmetadata.org>. With the exception of Flickr, the results of the test revealed that technical and descriptive metadata was consistently being removed from digital image files by the social media services during procedures for upload.

The **fourth goal (SG4)** was to explore the preservation activities undertaken by individuals, and to understand the degree to which individuals are aware of social media service providers' policies and procedures for managing user-generated content shared and stored with their service.

The survey findings reveal that nearly all of the participants store copies of their digital photographs when they upload images to social media platforms. The copies are stored on personal devices: personal computers, external hard drives and smartphones, as well as DVDs, and the Cloud. As discussed earlier, participants also download their social media photographs out of platforms and onto personal devices. Yet, this latter approach introduces the opportunity for digital photographs to be altered in significant ways. It could be seen as a method of ensuring the longevity of digital photographs collections; however, the potential for those digital image files to look different and be stripped of contextual metadata and social metadata during the download procedure, raises serious questions about the value of such a collection, especially for purposes of preservation. More needs to be understood about the relationship between the stored photographs and the social media photographs to determine their long-term value.

The survey findings reveal that barely any participants have had their accounts deleted by the social media provider due to inactivity or accident. This result was unexpected, especially considering that many participants have had their accounts for over six years. The small number of participants that did have their account deleted, most were able to have accounts restored along with their digital photographs. These results suggest that unless a participant experienced a problem with downloading their image files or through having their account deleted, they are less aware of the potential risks to their digital photographs collections held with social media services.

The survey findings reveal that most individuals skim or quickly review the social media service providers' Terms of Use documentation prior to giving their consent and joining the service. A minority of members actually read the Terms of Use (TOU) prior to opening a social media account. The degree to which individuals comprehend these TOU is difficult to calculate, considering most providers' TOU involve a lengthy set of complex legal documents, which are typically restricted to on-line viewing only (i.e., no download option), require extensive scrolling, and include hyperlinks to additional policies and procedures. Of those survey participants who read or skimmed the TOU, the majority recalled the Privacy Policy and the Terms of Service. These results were expected considering participants' primary reason for controlling access and reuse of their digital photographs collections shared and stored on social media platforms is protection of their privacy and the privacy of others.

Frequent changes to TOU are a common practice among social media service providers; yet, practices of prior notification of changes affecting members' accounts and/or content is inconsistent and dependent upon factors unique to each service. The explanation of these

services is buried within the TOU. This means that even if individuals read the TOU prior to joining the service, unless they consistently review the TOU over the years of membership, they are unlikely to be informed of the current roles and responsibilities of the service provider, changes in procedures, and more importantly the impact of evolving laws regarding privacy and freedom of information, data protection, and intellectual property on members' accounts, their personal information and their digital collections shared and stored on social media platforms. Individuals who are uninformed may be more likely to place their digital collections at risk than individuals who are aware of the TOU and have kept up to date with any changes made to the policies and procedures.

In the context of ensuring ongoing access to accounts and the long-term preservation of digital photographs collections stored on social media platforms, the clauses in TOU referring to procedures regarding inactive accounts and the accounts of deceased members are very important. The approaches taken by social media service providers' to terminating inactive accounts, providing access to inactive accounts and restoration of content and providing access to deceased members' accounts for family, friends and the social media community are neither standardized nor fixed. One possible approach to ensuring access to personal accounts and all related social media content is to record accounts and passwords and share that information with a beneficiary or trusted individual. Although some social media services TOU treat this activity as a breach of contract, members are not allowed to transfer social media accounts to others. Only a minority of survey participants had recorded a list of their accounts and related passwords. Several participants provided comments that indicate they have shared some of this

information with spouses. *"My husband knows about most of my accounts and my passwords, but we haven't discussed it"* (R_450).

In an attempt to understand the motivations behind participants' expectations of ongoing access to their social media accounts correlations were explored between years of holding an account and expectations; reading TOU and expectations; and account deletion and expectations. The connection between accounts and expectations suggest that the longer a participant holds an account the higher their expectations are of ongoing access. The connection between TOU and expectations suggest that individuals who read the TOU have more defined and conservative expectations than individuals who have skimmed or ignored the TOU. The connection between account deletion and expectations suggest that individuals who have had their accounts deleted by service providers have more defined and conservative expectations of ongoing access than those who have not experienced deletion at all.

4.6 Conclusion

The findings of the survey suggest that individuals hold free accounts with more than one social media service provider, and primarily use social media platforms to share personal digital photographs with others. Engagement with social media platforms is shaped by individuals' photographic practices and their purposes for sharing. As part of contemporary photographic practice, individuals perform activities of adding and removing contextual information about the circumstances of image creation (e.g., technical and descriptive metadata) prior to upload into the social media service, and about the circumstances of image use (e.g., social metadata) after upload. These activities are informed by individuals' photographic practice and supported by

available technologies, exchange protocols and social media platform features and functionality. In some cases, individuals are experiencing removal of metadata and alterations to the presentation features of digital image files as a result of activities of transmitting images into and out of social media platforms. The alterations and changes being made to digital photographs significantly impact their trustworthiness.

The finding of the survey reveal that individuals are concerned with controlling access and use of their digital photographs shared and stored on social media platforms. Their primary reasons for controlling access and use is to protect their own privacy and the privacy of other individuals who may be represented as subjects in the image content. These concerns reflect the fact that individuals are sharing personal photographs on multiple social media services, all of which have varying levels of privacy and access and different ways of controlling it. The potential exists for inadvertently sharing personal photographs with billions of people.

The widespread activity of saving copies of digital photographs collections on personal computers and external hard drives provides individuals with some assurance of continuing access to their photographs collections, but doesn’t address preservation of the actual digital photographs shared in social media services. The activities of downloading digital photographs out of social media platforms may be aimed at preserving collections held on social media platforms, but the potential for removal of metadata and changes in presentation format make this an unreliable approach. Lastly, in the case of death, very few participants have compiled a list of accounts and passwords to share with a beneficiary. Without that information, accounts

cannot be accessed and the digital photographs associated with that account couldn't be removed from the social media service.

The findings of the survey addressed the four goals and identified issues/emergent questions for further exploration in the follow up interviews. These new questions emerged during analysis of the survey data through unexpected results, comments provided by participants in free-text boxes on the questionnaire and an interest in gaining a deeper understanding of particularly complex issues, such as participants' expectations of access in more than twenty years to their digital photographs stored on social media services.

The following three questions emerged from the survey data. The first question explores participants' perspectives on the issue of privacy in regards to sharing personal photographs. The second question explores the removal of metadata from digital images in more depth: firstly, participants' awareness of social media services' actions of stripping-out metadata upon download; and secondly, participants' own actions to remove metadata from their digital photographs prior to sharing. The third question explores participants' perspectives of the relationship between the stored copies of digital photographs collections on personal devices and the digital photographs collections shared and stored on social media platforms, in order to determine where images attributed with long-term value might reside. In addition to these emergent questions, the survey was necessary for refining the existing follow-up research questions guiding the interviews and providing an additional follow-up research question. The four follow-up research questions and their goals will be discussed in the next chapter.

Chapter 5: In-depth Exploration of Existing Photographic Practices

An interview-based study was conducted with 18 participants drawn from a sample of participants from the web-based survey study on the trustworthiness of digital photographs accessed and stored on social media platforms. The goals of the study were to gain a more in-depth understanding of photographic practice involving mobile/smartphones and social media platforms, as well as the value that individuals attribute to their digital photographs collections held with social media services.

5.1 Research Questions

Three follow-up research questions were identified for the interview study at the outset of the research. Steps taken following the survey study included refinement of the three follow-up research questions and the addition of a fourth. The four follow-up research questions for the interview study will be discussed in terms of their goals, as well as their relationship to the interview protocol.

The first follow-up research question was: To what extent do contemporary photographic practices involving mobile/smartphones and social media platforms differ from earlier film-based practices? The goal of this follow-up research question **(IG1)** was to explore in detail the differences and/or similarities between individuals' activities of creating, sharing and storing film photography and contemporary digital photography. The emergent question from the survey findings regarding participants' perspectives on the issue of privacy in regards to sharing personal photographs was also explored through the interview discussions contrasting film-based

practices and current digital practices. This research question informed interview question 1 (the full interview protocol is provided in Appendix F).

The second follow-up research question was: To what extent do contemporary photographic practices impact the reliability and accuracy of digital photographs? The goal of this follow-up research question **(IG2)** was to explore in greater depth individuals' processes for adding metadata to their digital photographs before upload to the social media platform, and to gain an understanding of individuals' perceptions of the importance of adding metadata to digital photographs. The emergent question from the survey regarding the actions of individuals to remove metadata prior to upload was also explored. This research question informed interview questions 2 through 4. In order to explore the issue of reliability, the interview questions ask participants to discuss procedures over creation involving the addition of information to the title of the image file and folders, as well as metadata to identify the photographer and the persons concurring in the creation of the digital photograph. In order to explore the issue of accuracy, the interview questions ask participants to discuss the procedures for and the importance of transmitting digital photographs to social media platforms with creation metadata (both technical and descriptive) linked to the digital file.

The third follow-up research question was: To what extent do social media providers' policies and procedures for managing and storing digital photographs in social media platforms influence the authenticity (i.e., identity and integrity) of digital photographs? The goal of this follow-up research question **(IG3)** was to explore in greater depth individuals' processes for adding social metadata (e.g., comments, hashtags, ratings, likes etc.) to their digital photographs after upload to

the social media platform, and to gain an understanding of individuals' perceptions of the importance of adding social metadata to digital photographs. The emergent question from the survey regarding participants' awareness of social media platforms stripping-out metadata upon download was also explored. This research question informed interview questions 5 through 7. In order to explore the issue of authenticity, which is comprised of identity and integrity, the interview questions ask participants to discuss procedures for adding social metadata (e.g., comments, hashtags, ratings and likes) to digital photographs as part of their sharing procedures on social media platforms, as well as methods for protecting files from unauthorized access and use during activities of sharing and storing photograph collections online.

The fourth follow-up research question was: What are individuals' perceptions about the continuing access and long-term preservation of digital photographs collections on social media platforms? The goal of this follow-up research question **(IG4)** was to explore individuals' perceptions of the benefits and/or obstacles of social media platforms to the preservation of digital photographs collections for future generations; and individuals' plans (if any) to pass down their digital photographs collections to future generations. The emergent question from the survey regarding participants' perspectives of the relationship between the copies of digital photographs collections stored on personal devices and the digital photographs collections shared and stored on social media platforms, in order to determine where images attributed with long-term value might reside was also explored. This research question informed interview questions 8 and 9. In order to explore the issue of trustworthiness, the interview questions ask participants to discuss procedures for controlling access and preservation of digital photographs collections

that are stored online and offline, identify the authoritative records and designate trusted custodians to provide stewardship of personal photograph collections in the case of death.

5.2 Method

The one-to-one semi-structured interviews were conducted over a one-month period using several modes. Participants were recruited from the previous web-based survey population.

5.2.1 Participants

A purposeful sampling strategy was used for the interviews. The study sought individuals who had participated in and completed the web-based survey, specifically individuals who indicated their willingness to be interviewed and who provided their email address for contact (response to Q.31 of survey). Additionally, these individuals had to use mobile/smartphones in their photographic practice (response to Q.7 of survey).

In February 2015, initial contact was made with each potential interview participant via email; the letter of invitation referenced the previous survey and explained the basis of the follow-up interview. The “Letter of Invitation for Interviews” can be found in Appendix E. If a response to the letter of invitation was not received within two weeks, a second letter of invitation was sent via email. No further invitations were sent after the second letter to avoid harassing the potential research participants.

There were 132 potential participants selected for follow-up interviews. Of that group, 20 individuals responded to the invitation, but only 18 (6 female and 12 male) were able to schedule

a time to be interviewed. The interview participants were distributed among 6 countries, with half located in Canada. Ages ranged from 19 years old to 69 years old. Informed consent was obtained from all participants. Participants were not compensated for their participation. Selected attributes of the interview participants can be found in Table 7.

Selected Attributes of Interview Participants									
Respondent ID	Age	Country	Gender	Account Type	Years as Member	Photo Practice	Social Media Use	Total Images	Expect Access
R_267	19–29	Canada	Female	Free	6–10	Fine Art	Both	1,001–5,000	20 yr ≥
R_336	19–29	USA	Male	Both	2–5	Professional	Business	1,001–5,000	10–20 yr
R_489	30–39	Canada	Male	Both	6–10	Both	Both	101,000 ≥	20 yr ≥
R_35	30–39	USA	Female	Free	6–10	Amateur	Personal	101–500	10–20 yr
R_229	30–39	Australia	Female	Free	6–10	Amateur	Both	501–1,000	10–20 yr
R_445	30–39	France	Female	Free	11–15	Amateur	Both	501–1000	1–3 yr
R_474	40–49	Canada	Female	Both	6–10	Both	Both	50,001	4–6 yr
R_215	40–49	Canada	Male	Free	2–5	Both	Both	101–500	Don't know
R_195	40–49	Canada	Male	Free	6–10	Amateur	Personal	101–500	7–10 yr
R_271	40–49	Canada	Male	Free	6–10	Both	Personal	10,000–50,000	Don't know
R_90	40–49	USA	Male	Free	6–10	Amateur	Both	1,001–5,000	Don't know
R_484	50–59	Canada	Male	Both	2–5	Both	Both	101,000 ≥	Don't know
R_268	50–59	Canada	Male	Both	6–10	Amateur	Both	1,001–5,000	Don't know
R_339	50–59	USA	Male	Free	2–5	Professional	Both	501–1,000	Don't know
R_366	50–59	Sweden	Female	Free	2–5	Amateur	Both	1-100	4–6 yr
R_478	60–69	Canada	Male	Paid	6–10	Both	Both	10,000–50,000	Don't know
R_308	60–69	USA	Male	Free	6–10	Professional	Both	101–500	<1 yr
R_354	60–69	England	Male	Free	6–10	Professional	Both	1–100	<1 yr

Table 7 - Selected Attributes of Interview Participants

5.2.2 Materials

An interview protocol was created for the semi-structured interviews to ensure that a consistent approach was used with all participants. The interview protocol included ten interview questions, nine of which were based on the four interview goals (IG1, IG2, IG3, and IG4). An interview script guided the researcher through the interview process. The script included a reminder to collect informed consent prior to commencing the interview, an introduction, the follow-up research questions (not asked), the related nine interview questions, a final open question that asked interview participants to discuss any emergent issues of interest to them, and a final reminder to thank the participants and let them know that they would be receiving a transcript of the interview for the purposes of review and approval. The interview protocol can be found in Appendix F. The interviews were estimated to last 45-60 minutes.

Semi-structured interviews were conducted using several interviewing modes. Prior to the interview, participants were given a choice of Skype-to-Skype (audio only), Skype-to-phone, or in-person. All interviews were recorded with the permission of the interview participants, and then transcribed. The interviews conducted using Skype-to-Skype (6) and Skype-to-phone (10) had the audio recorded with an add-on program, Call Recorder for Skype. The interviews conducted in-person (2) had the audio recorded with an Olympus DM 901 digital recorder. After each interview was conducted, the audio files were transcribed using Dragon Dictate, dictation and transcription software compatible with the Macintosh OS/X operating system. To ensure accuracy, a procedure was created that enabled the researcher to listen to the audio file and dictate to the transcription software. This was followed by several reviews of the transcript to correct mistakes made by the audio transcription software.

5.2.3 Procedure

Individuals interested in participating in the study were required to agree upon a date and time to be interviewed, as well as an interview mode. Prior to the interviews, individuals received the interview questions, a URL to the preliminary survey results (in response to Q.32 on survey) and a consent form via email (Appendix G). The questions were provided along with the caveat that individuals were not expected to prepare for the interview. Prior to commencing the interviews, introductions were made, and the researcher explained the overall purpose of the study and confirmed receipt of the signed consent form. Participants were assured that they could end the interview at any time, that the audio would be recorded and that their responses would be anonymized.

Ten questions were asked, the last of which was entirely open, providing an opportunity for the interview participant to discuss any issue of his or her own choosing. However, throughout the interviews, participants were encouraged to explore emergent issues and to lead the conversation in new directions. In some instances the responses provided by interview participants addressed more than one question, and this required the researcher to make adjustments to the interview, such as skipping ahead or returning to a question, at times more than once, to ensure a complete response. By adopting a flexible and responsive approach to the conversation, the researcher was able to establish a rapport with interview participants, and cultivate opportunities for deeper insights and a better understanding of the topic. Throughout each interview the researcher made notes with pen and paper. Immediately following each interview the researcher's notes were reviewed and input into a Microsoft Word document and the interviews were transcribed.

The interview questions were grouped according to the interview study goals, but they were asked one at a time, in sequence. In the interview protocol the corresponding follow-up research questions are included, but they were not asked.

The interview began with a question related to goal one (IG1):

1. ***I'm interested in comparing earlier film-based photographic practices with current digital practices that use social media platforms. If you can recall how you created, shared and stored film-based photographs, please explain the major differences between your film practice and your current digital practice.***

This question was followed by a set of questions related to goal two (IG2):

2. ***The survey reveals that nearly fifty percent of photographers add information about the creation of their photographs (e.g., who, what, where, when, why, how) before sharing them on social media platforms. Would you describe your practice step-by-step?***

3**. *Do you believe that adding and/or removing image metadata in digital photographs before upload is important?***

4. ***Why or why not?***

Another set of questions related to goal three (IG3) followed:

5. ***The survey reveals that seventy-five percent of photographers add comments and tags to their photographs after uploading them to social media platforms. Would you describe your practice step-by-step?***

6. ***Do you believe the addition and/or removal of comments and tags from digital photographs after upload is important?***

7. ***Why or why not?***

Another pair of questions related to goal four (IG4) followed:

8. ***In the past, families passed down photo albums to younger generations or donated personal photographic collections to archival repositories. What benefits and/or obstacles do you think social media platforms introduce to the preservation of digital photographs and photographic collections for future generations?***

9. ***How will you pass down your digital photographs to future generations?***

The very last question asked in the interview was an open one:

10. ***Is there anything you would like to add?***

The minimum time taken to complete the interview was 18 minutes 4 seconds and the maximum time was 77 minutes. The average time it took to complete the interview was 38 minutes 41

seconds (*SD* = 14 minutes 26 seconds). The median was 36 minutes 41 seconds. At the end of the interview the participant was given the option to receive the interview transcript for purposes of review and approval as a digital file via email, or as a hard copy through the postal service. All the participants chose to receive the transcript as a digital document via email.

5.3 Results

The audio recordings for the 18 interviews were transcribed for analysis, along with the researcher's notes. The researcher analyzed the responses through a process of directed content analysis, in which a combination of deduction and induction was used, followed by conclusion drawing.

5.3.1 Data Preparation

The interview transcripts were anonymized, with names and institutions removed. Interview participants were referred to by a unique reference ID, which had been automatically assigned to them earlier in phase one, when they participated in the web-based survey. The unique reference ID is used throughout this chapter when reference to the speaker is required.

The first round of analysis involved printing out the transcripts and reading through them. The second round of analysis involved reviewing the transcripts with a set of *a priori* codes that were developed from relevant studies and theory, and compiled at the outset of the research. The third round of analysis involved generating codes from the text. The researcher notes were also reviewed, assigning codes to phrases and single words. Subsequent rounds of coding and content analysis were conducted using NVivo 11 for Macintosh, software that supports qualitative data

analysis. This process was inductive and iterative: emerging codes were identified in the text and added to the list of codes. The final list of codes includes only those that were used, derived from theoretical considerations prior to the data analysis (identified in italics) and from the text itself (see Table 8).

Final List of Categories and Codes		
Film Practice	**Metadata**	**Text and Image**
Code: fp*Creating*	Code: *Accuracy*	Code: Engaging
Code: fp*Managing*	Code: Context	Code: Interacting
Code: fp*Sharing*	Code: *Identity*	Code: Storytelling
Code: fpSharing>Albums	Code: Social MD	**Participant Emotions**
Code: fp*Storing*	**Preservation**	Code: Anxiety
Digital Practice	Code: Access	Code: *Concern*
Code: dp*Creating*	Code: *Archives*	Code: Doubt
Code: dp*Managing*	Code: Back Up	Code: Fear
Code: dp*Sharing*	Code: Back Up>Cloud	Code: Joy
Code: dp*Storing*	Code: *Integrity*	Code: Nostalgia
Code: dpDeleting	Code: Platform	Code: Obligation
Code: dpLoss	**Social Media**	Code: Regret
Film-vs.-Digital Practices	Code: Benefits	Code: Secure
Code: Cost	Code: Obstacles	Code: Shock
Code: Effort	Code: Uses	Code: Sorrow
Code: Physical	**Legal Framework**	Code: Surrender
Code: Quality	Code: Copyrights	Code: Uninformed
Code: Quantity	Code: Creative Commons	**Participant Values**
Code: Quantity>Digital	Code: Ownership	Code: Dangerous
Code: Quantity>Film	Code: Public vs. Private	Code: Important
Code: Time	Code: *Terms of Use*	Code: Risky
Code: Trace		Code: Unimportant
Code: Value		Code: Untrustworthy

Table 8 - Final List of Categories and Codes

Coding produced an average of 214 codes per transcript. Prominent categories were identified through a process of reviewing, coding and establishing relationships among codes. The codes were mapped into the following categories: (1) Film Practices - these gathered activities that contribute to the generation, management, sharing, and storing of chemical-based photography; (2) Digital Practices - these gathered activities that contribute to the generation, management, sharing, and storing of pixel-based photography; (3) Film vs. Digital Practices- these gathered opinions regarding the differences between film-based and pixel-based practice; (4) Metadata - these gathered activities and opinions related to adding contextual information about the photograph and its circumstances of creation and/or use; (5) Preservation - these gathered opinions and activities specific to ongoing access to digital photographs collections throughout the long term; (6) Social Media - these gathered opinions and activities specific to social media platforms; (7) Legal Framework - these gathered opinions and activities specific to the rights and responsibilities in the online environment; (8) Text and Image - these gathered opinions about the combination of text and image and its impact on communicating the meaning of photographs; and (9) Emotions and Values - these gathered the emotions and values participants expressed about different aspects of generating, managing, sharing and storing their digital photographs.

5.3.2 Film-based Photographic Practice vs. Digital Photographic Practice

In Q.1 interviewees were asked to describe and contrast their processes for creating, managing, sharing and storing film-based photography with their current digital photography practice involving mobile/smartphones and social media platforms. In terms of creation, interviewees emphasized the difference in volume between film-based and digital photographic practice. In their responses to the question, interviewees recalled taking far fewer photographs with film and

producing single sets of photographic prints for viewing and sharing, possibly duplicates of really important events, but rarely multiples of an image (unless ordered by a client for specific business purposes).

> *I think the first difference between film photography and digital photography is a huge increase in volume. Basically for a lot of my adult life I didn't even have an analogue [film-based] camera and when I did take photos they were taken judiciously at events probably and family things. Now, because I have my phone and it has a good camera on it—I take photos all the time. . . . In the analogue [film] era I didn't really share that much. I may have developed duplicates of my photos, but more often than not they just stayed together [the film and the photographic prints]. Going back though my film prints [photographic prints] I can see that I didn't really share that much. . . . Now I share digital photos by email, but also through Facebook, Snapchat, Flickr, and I just got an Instagram account* (R_90).

The interviewees described a number of conditions that hindered the creation, management and sharing of film-based photographs, particularly the inconvenience of traditional film cameras, the cost of photographic materials and development services, the amount of effort and time required, and the proximity necessary for sharing photographic prints with others. These conditions influenced how many photographs were created and the way they were managed and shared.

The costs of film and development services were noted as limitations on the amount of photographs individuals created and shared: *"Film was expensive in those days. [I shot] maybe*

ten rolls a year" (R_366). In contrast, interviewees considered the expense of sharing digital photographs on social media platforms as negligible. *"But when Facebook came along, we used to go out and party and take pictures of one another, we could post things on Facebook. That way we could share it and the cost of printing was gone. So that was the main difference–you could take a look at your pictures and you could share them, and it wasn't as expensive [as film]"* (R_271).

The actual bulk of traditional film cameras deterred interviewees from carrying them, especially when contrasted with the convenience of taking photographs with mobile/smartphones: *"I rarely take analogue [film] camera shots, because I don't like carrying a camera in my pocket. Now, because I have my phone and it has a good camera in it, I take photos all the time"* (R_90). In addition to activities of creation, interviewees contrasted the effort involved in sharing photographic prints with family and friends in other parts of the world with the ease of sharing digital images on social media platforms.

> *I have lived here in France for 10 years and when I first came here I still had a camera with film. Those photos I would print out and send to my family. I don't know, it felt a little more special to send photos by mail, but it wasn't very easy so I wouldn't do it often. Again, the difference for me is the ease of digital cameras and being able to share materials produced that way. . . . I have an iPhone 4, so it is not the best of cameras, but it's really easy to take a picture of where I am, or a project I'm doing and send them to my family* (R_445).

The issue of proximity was brought to the forefront when one interviewee described how she would share her film-based photographic prints in the past. *"I feel like I probably shared photos less when I used film back in the day. As for sharing them, you would automatically get doubles and give them to the other person. Maybe you would take them and show them, and in high school I think we would pass them around and share them from the week before. But there was less sharing of pictures"* (R_35).

An interviewee who takes photographs for both personal communication and business purposes, identified the length of time involved in developing film-based photography as a significant encumbrance to dissemination, especially when contrasted with digital practices of creation and sharing involving mobile/smartphones and social media platforms.

> *It's amazing; it's so easy to share things with digital now—compared to film. If I want to send somebody a picture that I took on film, I have to take the picture then I have to drive it up to the development place, then I have to get it developed and wait for them to do everything else. I have to wait all day. The person I'm sending the pictures to is not going to get them for a week, whereas with digital I can use my cell phone and I could send it straight to them in an instant* (R_336).

Several interviewees explored in greater depth the relationship between time and photography, associating chemical-based practice with long duration and digital practice with instantaneous results: *"Now I can take a picture halfway across the world and share it in real time, whereas all the pictures on my [film] camera would literally have to wait"* (R_271). In some cases the

immediacy of digital photographs created with mobile/smartphones and shared on social media platforms is influencing the purpose of photography.

> *So I'm not just memorializing vacations, holidays and graduations—it's more like a comprehensive documentation of daily life, if that makes sense. It's a lot more intimate and a lot smaller moments. Since digital photography has come around I rely on images for communication much more than text. I use sharing not just to share an image that someone was at an event, but also to relay stories. If I'm walking around and I see something shocking or funny I'll share that digital photo. I will share experiences and ideas, and sometimes I relate my mood through digital photos. Also social commentaries and political demonstrations—I think an important part about sharing digital photos for me is calling someone out. So, if I see a confrontational cop, or I see someone acting like a jerk, or I go into a bathroom at a restaurant and it's dirty—it is shared on Facebook and I will call them out. . . . I also share as a learning tool, so like, to elicit feedback from better photographers. You can do that on Flickr, you can put your photos up there and sometimes photographers will say "I like this image but, such and such" and I've learned a lot from that* (R_90).

A number of interviewees discussed the process of viewing digital images during the creation process as a powerful tool for improving their photographic skills: *"Now I have more control as I'm shooting to try and reframe the shot or reconsider it and get the product that is more like what I was looking for"* (R_215). They contrasted digital capture devices with earlier film-based cameras that provided no preview capabilities: "*So I think that now there are some great options in terms of taking digital photos, because with digital cameras when I go out and take pictures I*

might take ten images and just try things out and I can see them right away, which I appreciate" (R_445). Additionally, one interviewee described how the immediacy of digital photography encourages him to create and share more than he did with film-based photography.

> *Back then I didn't really share my photographs at all except with friends, but hardly ever. Now, for one reason or another I find myself more and more sharing my photographs. In particular the photographs that I take related to my business and my creative work, that stuff is getting shared a lot. I guess I find it more satisfying now because I wasn't a great photographer back in the day, so when I went out and shot rolls of film and you know… spent the money to get them processed, it was often quite discouraging what I would get back* (R_215).

When contrasting film-based and digital practices of sharing personal photographs several interviewees addressed the issue of privacy in the networked environment. The common approach is to manage privacy with the settings available in the social media application. *"Once again it's all about the privacy settings issues. You can set your settings so that everybody in the free world can see you and what you're doing with your friends. Or you can set it so that only your friends and your acquaintances, or just your friends can share with you"* (R_271).

However, interviewees had additional concerns about protecting privacy in the online environment and discussed alternative methods to controlling their personal privacy.

> *My photos are only on Facebook for about a week or so and then I delete them. I have concerns about big brother. I also have concerns about privacy policies that morph and*

the provider doesn't tell you. . . . I am aware that I don't have any privacy when I'm on Facebook so I act accordingly and I don't put my life on there (R_90).

Several interviewees discussed the activity of tagging individuals in photographs and sharing on social media platforms, *"I tended to not use people's names in the photographs; for the sake of privacy. Now, it is dependent upon how I feel about it at a moment, so there is not a real rule."* (R_308). For some this was seen as a potentially dangerous activity due to privacy concerns, *"Facebook now gives you an option that they can tag you but you have to okay the photo before it's posted online. But there is also privacy issues, for example women who are hiding from their abusive husbands get tagged and I think it puts you in harms way as far as cyber stalking"* (R_90).

Lastly, one interviewee discussed potential privacy issues with accessing accounts of deceased family members, *"Privacy of deceased accounts is going to be a huge issue. I can already see that there will be times when someone is going to pass away and Facebook is not going to let them have his pictures. They're not going to let anyone log into his account* (R_336).

The combination of convenience, ease, affordability and immediacy of digital photographic practice results in more images being created, managed, and shared. Interviewees emphasized the increasing volumes of digital photographs and how this impacted their collections management practices: "*Chaos. Yeah, I create more than I can control and I should be editing as I go. Currently they're just all stored in iPhoto"* (R_215). Several interviewees raised the issue of managing multiple versions of digital image files.

I think I have 50,000 digital photos. I think it is probably more than that. I just uploaded from my computer to the new Mac and I was like "that number can't be right." I wanted a new computer because my old computer was really slow and I think I just killed my new computer by transferring those photos over. I would love someone to come in and you know, deal with it. All those images are saved and every time I resize a photo or edit it there is one picture with five versions of it, and I would love to kill all those versions, but I didn't at the time and so they are just there and I don't need the raw data of the image. I haven't looked at it in 10 years, but I'm not really going to go back and sort it all out. In the future I might be wiser about it (R_474).

I think my biggest concern with this right now is—where are we in 20 years when we've been gathering digital photographs and digital data from you know 40 and 50 years? We are going to need something smarter then our current, you know, our current system. . . . I've been to Mexico twice and in another 20 years if I go another seven times and take pictures of Mexico I'm now looking at hundreds of images and how do I find just one of them? . . . And the volume of pictures I have of my cat – it's obscene. The analogy that comes to mind is that it's like drinking from a fire hose (R_489).

A number of interviewees with professional practices had positive responses to managing extensive digital photographs collections because of consistent metadata practices. "*Despite having almost 3/4 of 1 million photographs on my archive compared to having you know two or three binders to look through, the finding it digitally will be way easier than going through the books. Even though it's such a massive amount when compared to my film photographs. It's just*

simply because there is a search function. I can just type in hockey and well here's every hockey assignment I shot, because my archive is organized by date and assignment" (R_336).

In contrasting management and organizational activities for film-based photography with current digital photography, several interviewees drew correlations between writing information on the outside of photofinishing services' envelopes, and creating unique digital folder names incorporating date and subject information.

> *Do you remember those envelopes that Blacks [Photofinishing service] would return the photographs in? So basically I have–well it's not a shoebox, but it's a storage case where I have every one of those envelopes. Maybe 100 of them. I have stored them chronologically and I have noted the events and the year that they took place and the negatives are stored with the images, with those prints. All of them in a cardboard box. The envelope for my film photographs will have the event that I photographed and the year. And my iPhoto has the same thing. For example the last thing I photographed was "Los Angeles, San Francisco, December 1994" and every image in that folder is from that trip* (R_195).

In regards to creation and sharing, several interviewees suggested that an increase in volume results in a decrease in the attention given to digital photographs, especially when contrasted with earlier modes of sharing printed photographs, such as photo-albums.

> "*The number of digital images shot is just insane. . . . There are so many images taken and available that people aren't looking at them. Once viewed, they're probably not seen again due to the volume. . . . Photographs are throwaways now. People enter them into*

their computers and you know they view them a few times and then they just sit in this digital form in these folders and they never see them again" (R_308).

Photo albums, when we were kids that was the sort of the thing to do. And actually, I enjoyed going to other people's houses and going through some of their photos and stuff like that, people used to do that. But back then people used to take less pictures right. So the volume that you take with digital, you couldn't really put that many pictures into photo albums. . . . Really, after a while, after you take the pictures, and take a whole bunch of them and post them, not a lot of people go back to look at them again right. . . . So the quality of current pictures and the sheer volume is what sort of makes the older photographic prints more special (R_271).

When describing the difference between processes for storing film-based materials and digital photographs collections, most interviewees contrasted the traditional "store and ignore" approach of physical materials, with current approaches to digital collections involving reoccurring backup activities on personal devices and cloud-based services. Most interviewees rely on imaging software to automate download and backup activities. Those interviewees with a professional practice have established workflows for downloading digital image files off smartphones and onto personal computers, whereas, interviewees who use social media platforms for sharing personal photographs have a more haphazard practice that involves regular sharing by smartphone and monthly or sporadic downloads for storage purposes. "*I'm extremely slack, so I take all the photos and then I hope to Christ that I don't lose my phone before I get around to synching my phone with my laptop once every 3 to 4 or 5 to 6 months. And then about once a year I put my whole laptop on my hard drive"* (R_229).

Both interviewees with professional and amateur practices described actions of capturing digital images with smartphones and using cloud-based services for storage. Their experiences suggest that large multi-media transfers may challenge some types of available cloud-based services. As a result, interviewees are reticent to trust the Cloud as a reliable and secure storage solution.

> *So I was doing a lot of stuff on my iPhone, especially when I got kind of better in recent years and my phone was filling up so quickly that I went to the iCloud system so I could be downloading and delete things and stuff. But the iCloud could not back up things quickly enough. At one point I had a new phone and I had been using it for a number of months and I hit the wrong button when I was backing up and lost like 5000 images. . . . After I lost stuff, I decided iCloud wasn't up to snuff for what I wanted to do and it wasn't economical and it was untrustworthy and I didn't have it in-house. So I am no longer in iCloud. It was a nightmare* (R_484).

> *I guess now with the cloud and stuff—iCloud, more and more of my stuff is getting stored in the virtual world rather than being stored on a hard drive. I should say I have irregular archiving practices. I do it more often than once a year, but it's not an automatic update to iCloud. Sometimes it's a full system or full archive backup of all of my work, or sometimes it is specifically just the images that I backup. I don't really trust the cloud that much, so if I'm doing that I will also backup to a hard drive, so I have a physical thing, because I don't really know where things go in the cloud. I'm sure most people don't. I'm just not that trusting of the invisible world* (R_268).

We pay for cloud storage to a company but it seems that most of the time it isn't working properly. So we switched companies but it's the same thing. You get a couple of terabytes of space but it might take a year and a half to upload 500 GB to it. With both of the companies that we used the connection would timeout before the upload was complete. Unless it was a really, really small upload. At some point you ask "why am I spending the money on this," because the photographs are a big part of what I need backed up but I don't really know if they're all there (R_215).

5.3.3 Social Media Platform Characteristics

During discussions about their digital photographic practices in response to Q.1, most interviewees described actions of sharing digital photographs on specific social media platforms to fulfill different purposes. Several interviewees described how specific platforms supported business or personal photography.

I will jump onto these new things as they start but they rarely have any kind of longevity for me. Now I feel that Instagram is the first sharing website that really suits my photographic process so I can see it being something that I could continue with and in a way it is kind of a beautiful document in the way that I don't find Facebook as attractive, but I do like to scan back through a year of Instagram. You know I think that's the way that creative, or some creative people in my industry are using it as a way of journaling their process and letting people in on what goes into the design and the fabrication and what's going on in the studio behind the scenes (R_215).

I share on Facebook and Flickr–some of it is sewing specific so it might be a contest or a giveaway. If I post to a specific group it's usually through Flickr, there's a lot of linking back and forth. Flickr would be more professional and Facebook would be more personal. Instagram is what I would really like to do but I'm not going to start another thing. I will go on Instagram and look at other people's photos and some of the people I like and admire, I see that's the medium they use and that's the language I understand (R_474).

A few interviewees described their use of different services in relation to platform features for instant sharing or more permanent storage, and the type of interactions with other members of the social media community.

Facebook is certainly the great equalizer anything and everything can go there. Actually Facebook is almost like the shoebox. The family stuff goes there, the casual stuff goes there, the "this isn't really a great picture but commemorates a moment" goes there–it's the photo-album and it's the shoebox. Flickr and 500 Pixels are the framed photographs on my wall, right? And Instagram is something new. The community is an element in which you create for. The other thing I find interesting obviously, is the formats. Having an image as a square changes how you see a scene when you're shooting at. You start to think in squares as opposed to in rectangles (R_489).

I tag and put comments more so on Facebook because there is a space for it and I'm connected to more people on Facebook. And on Facebook I'm connected to people with

more of a personal relationship than on Twitter. I do have dialogues on Twitter with past interns or with authors for work (R_445).

I was going to bring up Snapchat real quick. I just think it's so amazing that I could whip out my phone and snap a picture and send it to all of my friends instantly. . . .But, the storytelling ability of Snapchat is very limited, that's my issue with it. My number one [social media platform used] is Instagram, hands-down. Instagram is my favourite thing by a very long shot. There have been times when I have seriously considered getting rid of every single one of my social media platforms but keeping Instagram (R_336).

5.3.4 Risks to Reliability and Accuracy of Digital Photographs

In Q.2 interviewees were asked to describe their processes (if any) for adding information about the creation of their photographs prior to uploading digital image files to social media platforms. They were also asked to share their opinions on whether they believed it was important to add and/or remove metadata from digital photographs and to explain why.

Those interviewees who identified themselves as having a professional photographic practice (or both professional and amateur) described procedures for importing digital images out of capture devices and onto computers that rely on software programs to automatically apply metadata templates to batches of photographs. When discussing the importance of metadata, the interviewees emphasized the role of metadata in supporting searches across large digital collections and providing context for image content.

First, I capture the image and then I import images into Lightroom—either files from the smart phone, DSLR or scanned film. Everything is filed by the date and placed in a folder named in relationship to the where and what of the images—something short. Next I add metadata, such as keywords etc. I have basic metadata templates, containing basic info upon import. After importing [to my computer] I enter more descriptive keywords to improve search results (R_308).

I tag using iPhoto—it's basically keywords. I tend to blanket keywords, so I'll grab a whole bunch of photographs from a day and throw in a couple keywords that work for that, or I go through individual photographs and if there is a person, I do face tagging. I tend to do that, but it depends if it is someone's birthday or something like that. Trips—it's a little less important, but with family members I will go through and tag. So I have my wife, my parents, my brother-in-law and I can just click on their face and the name in the iPhoto library will attach to them. I think it's important for me personally. It lets me know where I was, what was going on and what the context was (R_489).

In particular cases, such as interviewees that use social media platforms for business purposes, the addition of metadata to digital photographs was discussed in regards to management activities, but it was also understood as a method for asserting ownership and controlling unauthorized reuse (e.g., including copyright information).

Yes I do [add metadata] because I'm interested in ensuring that my name stays attached to any photographs and I do watermark them as well, unobtrusively, but it has my name on. Why that's important? Well I just think it's important to protect your ownership and I

don't really understand or have time to worry too much about the whole Facebook specter of how they say that they have control. I'm not really up on it, but I've heard various things about that and they say that it's not yours because you put it on Facebook. I do have a copyright blurb that I add in Lightroom (R_478).

Of course [adding metadata is important]. First of all, not because of the "who, what, when, why, and where", but because it's important to have my name and contact details to make my materials available and to keep control of them. Secondly, yes indeed the "who, what, where, and when" is important so you understand what the picture is about. Yes [I add metadata for both my professional and personal images]. I use Photo Mechanic (R_354).

Not all the interviewees are engaged in routine procedures for adding information to their digital photographs prior to uploading into social media platforms. One interviewee described his process as occurring on the fly: *"On my phone when I'm sending a photo to Facebook I can identify people in the image and I can identify the place, but that is probably the extent of it"* (R_476). In other cases, filenames and/or folder-names were used to convey contextual information about the digital photographs and to manage digital collections in the absence of knowledge about embedded metadata.

I will put a file name on it for example "mom1973" and if I have the month or whatever. If I have any other related context I will output it in the filename, but the encoded data I have no idea… I mean, when you take a digital picture, I know it knows when the picture

was taken, it knows what camera, what settings, all of it. I just have no idea how to access that information or store that information (R_195).

I learned about metadata when I went on an exchange to Scotland at Edinburgh College of Art. That's when they introduced metadata and I was like, "whoa this is a whole other world that I didn't know about." I guess it's connected to copyright, because you're putting your name into it and date and your information so that no one can take it and use it however they please. So it is important, but I'm still just wrapping my head around it I guess (R_267).

Several interviewees recalled taking actions to remove GPS data from their digital photographs, either by changing the settings of their mobile/smart phones or removing the information from the actual digital image file. The primary motivation for removing GPS data was to protect the privacy of the photographer and/or persons represented in the image content.

I almost never add information about my photos and in fact I remove information. . . . Correct, I remove GPS by changing the settings on my phone. I remove that information for safety—people don't need to know. It's not relevant to the story of the photo. I think the image can standalone. I don't see any value in being like, "I've been there too" or "I know where you are". I don't get off on that, but I know a lot of people do. I guess it's about my kids in terms of their vulnerability. . . . I just don't need to add more information about the exact location (R_474).

This activity of blocking or removing global positioning system (GPS) data revealed the opposing aims of adding information to digital photographs for the purposes of managing collections stored on personal computers and removing information for purposes of sharing collections online. *"For my own collection I would say that 90% of the images I share, they are shared with the Exif data and the geo-tag intact (if it is available), or I add the geo-tag into them. . . . I love geo-tagging, I think it's awesome, but I do strip that data for sharing photographs of sensitive issues"* (R_489).

Many of the interviewees associated the addition of information about the digital photograph with providing additional context.

> *I feel like including all that information is very crucial to being accurate and it is very important to the future of media. That information is—you know—it gives you the background to what you're actually looking at. Especially with photography, there are so many times that I shoot a picture and it shows you absolutely nothing about what's going on around and outside of the subject. . . . If there is one thing that you take from this, double underline and highlight in eight different colours—metadata that goes along with the images is everything. It's never the proof, but it is the key to the proof* (R_336).

5.3.5 Risks to Authenticity of Digital Photographs

In Q.3 interviewees were asked to describe their processes (if any) for adding information about their photographs after uploading digital image files to social media platforms. They were also asked to share their opinions on whether they believed it was important to add comments, tags, ratings and likes to digital photographs within the social media interface, and to explain why.

Most interviewees add text in the form of captions and hashtags to their digital photographs in social media platforms, because social metadata makes the images more interesting to other social media members. This conclusion is based on the participants' experiences of engaging with other members' shared photographs and on observations of interactivity with their own shared photographs. One interviewee explained that tags embedded in the image file support management activities, whereas tagging the post that houses the image supports sharing activities.

> *If I'm sharing on Twitter, I'll tag them on Twitter. If I'm sharing on Facebook, I'll tag them on Facebook. We do this for a couple reasons: 1) it reminds me who was there, but 2) it also alerts them and kind of creates a ripple effect for sharing. So if I have an image that is particularly significant—in some cases the interesting thing that I have found is that the person is not even in the pictures it's just something that they'll find interesting, right, and that's done with contextual sharing. In tagging not in the image itself but in the post that houses the image* (R_489).

Many of the interviewees discussed the relationship that exists online between text and image, emphasizing how each social media platform prescribes the way that the two will be presented. The interviews as a whole revealed the depth to which some social media members are exploring the boundaries of the user interface to increase interactivity and engagement with others. There was considerable discussion about the concept of storytelling through text and images in the

online environment, with several interviewees likening the activity to interacting with physical photo-albums in which individuals could show and tell.

> *Normally in a newspaper you have the caption and below that you have the photograph, but here you have the hashtag and it is like a bit unobtrusive below, not really meant to be a caption but it can turn the whole meaning around in a more low-key way. It's really an interesting phenomenon. But I think that to publish just images without any text wouldn't be interesting. I think what people like about social media is to write something. It's also easy—text messages are only 140 characters. And people with their mobile phones want to do something that is really quick. It's something that is so attractive… the image is easy to take and upload, but without the short text I don't think they make an impact* (R_366).

> *I guess like if I post something to Facebook I don't just post a picture with nothing. So I usually write "here I was at the wherever, or whatever." And to me I do it because I figure I'm trying to tell a story or something. If you're looking at Facebook and you're asking, "where were they" or "what are they doing" I want to give the answer to those questions ahead of time. I also use Instagram and I think I almost always put at least some text. I actually think it's kind of weird when people put just a photo with nothing else on Instagram. I'm always like "what's wrong" or "I don't know what's happening, why don't you put a couple words." So I always caption on my Instagram* (R_35).

One of my very successful and one of my most famous images is a photograph of a Marine with a tear running down his face and you don't know where he's at, you don't know what time of day it is, you don't really know what's going on. You don't really know anything and it is the caption information that tells you it was taken at the crash site of United Airlines Flight 93 on the morning of September 11th 2010 during the moment of silence. And you read that and you're like "wow this image really changed for me" and you can actually look in my Instagram, if you can find that picture, there is actually a comment where somebody talks about that, they're like "whoa what happened here" and I'm like "here's the story" and they're like "wow that changed that image for me, it really means a lot to me now" (R_336).

Several interviewees who use social media platforms to share both business and personal photographs expressed a desire to increase their friends and followers in social media communities and explained how the addition of information, such as captions and comments, to digital photographs will result in increased views, likes and responsive comments by others.

"*I believe it's important to add comments and tags. For one thing I think the picture is much more interesting if you know "why" or "what it is" or "where it was." So just for those reasons alone, it enhances people's interest in the photos. I found that they're much more popular when you do that"* (R_478).

In our business stream of photographs I do find it a kind of strange influence on our production. I guess because in some ways a photograph on Instagram you could argue

becomes more valuable the more likes it has and I don't really like that idea particularly, but in a way it becomes kind of as if Instagram is a focus group sometimes. You put an idea up on Instagram that you're not quite sure about and suddenly there is this rush of enthusiasm or kind of dead silence, or something in-between, you know. So in that way it can be sort of a bit of a laboratory where the photograph is providing a lot of feedback from other people (R_215).

Two interviewees discussed instances of taking screen-captures to relay the larger context of a post made to a social media site for a friend who is not part of that particular social media community, or for memory-making purposes.

I have taken a screenshot for the purpose of sharing the context. For someone that doesn't have Facebook I take a screenshot of the Facebook post that has the image in it and the reply to it and send that off but that's getting kind of deep down the rabbit hole there. I find that I put stuff into Facebook but I don't take a whole lot off of it . . . . I think that in an image that has had context added, then you want to preserve the whole thing because it is not just about that image anymore, it is about the discussion and the interaction that it creates, right. The whole contextual purpose of adding commentary means that I want to start a discussion. A picture is worth a thousand words but a thousand words are also worth a thousand words (R_489).

There is a huge gas tank in the back of our studio that had to be dug up so we decided we would make a Time Capsule and one of the things that I did was I actually took a screenshot of our Instagram feed from the day that we made the time capsule and I

> *printed it out and I put it in the Time Capsule in the ground. I did it because the Instagram screenshot had so many images about what we were doing at the time and the interface looked so nice that I took it and I archived it into the ground* (R_215).

Interspersed throughout the conversations on adding comments and tags were expressions of concern regarding the permanence of textual annotations linked to digital photographs through the social media interface and metadata embedded in the digital image file prior to posting online. Several interviewees made references to social media services altering presentation format of digital images and stripping-out metadata during routine management procedures, *"I never bother to download my images out of social media because I've seen that the metadata have been stripped"* (R_354), as well as not recognizing (i.e., reading) all types of user-generated metadata that are written by commercial imaging software to digital image files.

> *Another issue about a lot of social media stuff is that they force you to convert to a specific file type. They also compress images and they force you sometimes to crop, especially with profile images. . . . Camera metadata is stripped out and you lose all that context, including the date of the image. Like I said before, forced compression and file format normalization result in really low quality images* (R_476).

> *Yes, well I could tell you straight up front that Facebook, as soon as you upload to them, they run your photos through all kinds of production software and resize it and strip all the color information out of it so as soon as you post it… it looks like absolute garbage. They just don't have room to hold everything at 100% quality so they are reducing the amount of colors, they're changing the bit rates, their resizing the images just to save*

space, because even though they have so much money they have a limited amount of hard drive space (R_336).

Better would be a system that integrates with others, so if you had put something into your image when you're uploading it to Flickr it will pull out the keywords and it will pull out the caption and it will pull out who created it, things like that. If more of these services did that it might actually encourage people to do it locally, because as it is now, photographers think "well okay I can upload it to wherever and it strips this stuff out, but I can go ahead and add tags in their interface." Well that is great for the interface and the company, both Google and Facebook have a way you can download all of your stuff at a later point, but none of that metadata comes with it. They are giving mixed messages. It's like they're telling you "please tag this, because we want to exploit this information, but we won't give it back to you" (R_339).

Several interviewees shared experiences and identified risks associated with social media service providers' policies and procedures regarding management and reuse of members' digital photographs shared and stored on platforms:

And when I checked the image it no longer had anything [metadata]. So it's like they did a big mass migration and didn't tell anybody and they stripped-out everything, it's like thanks a lot. That sucks! It's that boilerplate language that always scares the crap out of people about sublicenses. I have yet to find a lawyer that can completely explain it to me. And the terms can be interpreted multiple ways depending on who you are (R_339).

I feel like I've just kind of given-in to all of that so I don't have serious concerns about social media contracts. The one that I don't know if this was for real or if it was a rumour, or if it really happened… but the one that "weirds" me out a little bit is when people said that you put your photographs on Facebook and then they appear in an advertisement, or something (R_35).

Interviewees with professional practices discussed the issue of sharing digital photographs on social media platforms in relation to intellectual property rights. In particular, the reuse of social media photographs by third parties who do not have legal licensing agreements with the social media service provider, referencing a key legal case involving Daniel Morel, a photographer who posted images of the Haiti earthquake to Twitter (discussed in Chapter 2).

"*Well most people are amateurs and are unaware of a) the technology and b) their rights as creators, so they just click on it, do you agree, yes. I click on it because I don't put my pictures at risk, but I know the possible consequences of putting professional pictures through social media services. The obvious case to look at is the Morel case"* (R_35).

5.3.6 Perceptions of Continuing Access and Preservation

In Q.4 interviewees were asked to describe the benefits and/or obstacles introduced by social media platforms to the preservation of digital photographs collections for future generations. This question required interviewees to draw upon their experiences with social media platforms and their knowledge of social media service providers' policies and procedures guiding access to accounts (active and inactive) and storage and/or back-up of user-generated content.

Several interviewees discussed the potential benefits of social media platforms for preserving ongoing access and long-term preservation of digital collections through distributed storage: "*The one wonderful thing about digital stuff is that every copy, if it's done right, has the promise to be as good as the original. So you can have multiple sets of these and they can be fairly widely disseminated so the chances that they will all disappear are a lot less likely"* (R_339) and as backup services for copies of digital photographs collections already stored on personal devices: *"To my mind [social media platforms] enable you to have additional backups. I do backup all my photos to hard disks, but I have a Pro account with Flickr and I used to use that as a full backup, I just haven't lately"* (R_478).

The majority of interviewees associated social media platforms with sharing, not storing, and are not taking steps to backup photographs collections held within the social media service. One interviewee mentioned using the tools available from social media service providers to download her online content: "*I appreciate that you can print out a record of your Tweets, something I've only done once using their archive tool. . . . I wish there was something similar with Facebook, but considering the structure I see that might be difficult*" (R_445); but most of the interviews suggest that individuals view their shared digital collections as containing short-term value only. The relationship between social media photographs and the copies of digital photographs held on personal devices is one of published materials to originals: "*I would consider what I have on my computer to be the original image"* (R_90). Another interviewee referred to Facebook as: "potentially the magazine of yesteryear" (R_271).

This may be due in part to concerns about the obstacles presented by social media platforms to the preservation of digital photographs collections. Again, interviewees emphasized that social media platforms are aimed at sharing, *"Let's just start by saying that I don't see an acceptable preservation aspect to online stuff at all, it is just about sharing"* (R_90) and that the purpose of social media services is not long-term storage of digital photographs collections. Several interviewees expressed concern in regards to the quality and dispersion of social media photographs and the sustainability of social media companies.

> *I think that sharing digital images on social media makes you feel like they are saved. . . . I know I have to remind myself that just because I uploaded them to a social media service doesn't mean that they're always going to be available there. I think there are risks involved when I see some of my friends lose photos. A few years ago one of them had her hard drive crash and she lost all her photos but she said "oh but I have them on Facebook" but the quality wasn't the same, obviously. . . . So I think there is a real risk that if you only count on Facebook or other social media platforms for storage you are going to have trouble grouping them together and finding them later. There is always a risk too that these platforms will go away* (R_445).

> *Firstly, because photographs circulated in this way [through social media] can end up in the wrong hands, can be altered, can be combined with other photographs and as information will be stripped the origin of these pictures can be lost to your children, grandchildren and future generations. The second reason why it's a very bad idea to rely on social media is because who knows what will happen in five years time. If any one of*

> *these systems collapse, or disappear then your pictures go with them. The only safe way to preserve your pictures is to do it yourself* (R_354).

In conversations about the obstacles presented by social media platforms, several interviewees expressed a lack of trust in the ability of cloud-based services to provide ongoing access and long-term preservation: *Facebook is basically the cloud right there. Do I see Facebook as a way of storing, yes and no* (R_271).

> *Realistically if you're going to put stuff on the cloud, or social media for that matter you ought to take whatever steps you feel you can to protect yourself on that front. But realistically I think you need to operate under the assumption that your stuff is vulnerable. I think people are delusional if they think… for example I'm an Apple user and I don't put stuff on the cloud that is sensitive, for example personal financial files, because I don't trust it* (R_478).

Many interviewees shared concerns about the potential limitations to ongoing access and long-term preservation of digital photographs collections stored with social media services by making references to the implications of providers' Terms of Use (TOU). "*When you sign the contract and you agree to the terms of Facebook it says that they own your images or something like that. I think it's really precarious, the legal aspects of social media platforms*" (R_366).

> *But things like Facebook even if you put your copyright information on there… Facebook still owns a copy of it–you're not stopping anything* (R_336).

> *With social media anything that you can see - you have legal access to* (R_271).

Interviewees were also asked to discuss their plans (if any) for passing down their digital photographs collections to future generations. Most interviewees do not have plans for passing down their online digital assets: *"Well, I haven't made plans, I'm not prepared to disappear quite yet"* (R_354). One interviewee described a plan and his motivation for having one in place.

> *The interesting thing for me is account ownership. There are a number of dead man's switches online where essentially you can have, you know, maybe a list of passwords that are passed on to your family. In the event that you don't check-in in two weeks they unlock your accounts and release them to your family. My wife has specific instructions on what to wipe-off of my computer before sharing with any friends and family. Because before the Facebook account would just stay open after you die. My father-in-law was recommended as a friend for me four months after he died* (R_489).

The question prompted some interviewees to reflect on early film-based practices of making personal photo-albums and to consider approaches to accessing and curating digital photographs collections for the purposes of passing down a lasting visual record to their children or donating their digital photographs to a collecting institution. Almost all of the interviewees considered providing access to copies of digital photographs collections stored on personal devices, but not social media platforms.

It would be easy to find my digital photographs because there'll backed up in folders, so they're quite easy to find. My son is the sole beneficiary of everything so he would have access to my computer is if he wanted (R_268).

Probably I will make some paper prints of my 100 best photos or something like that. Or see that the children get the digital files for themselves. When they were small, my children were born in 1988, 1990 and 1992 - and I suppose it's when I had the third child that I couldn't find the time to make albums anymore. But I think that they would like to have their photos. Yeah, so I will probably talk to them because you always think that it will happen some other day and it's not so urgent. But I realize now that I will have to show them where the files are at least. Or I might give them a USB stick of images that they would like (R_366).

The simple thing to do is to take the hard disks and put them in the back of the car and drive them down to the museum (R_354).

If I died and my family got my computer, they would have a really well systematized collection of thousands of photographs. And I think they would be really happy to get that. I've got every Thanksgiving and every Christmas in an iPhoto album (R_90).

In a couple of instances the lack of long-term value attributed to social media photographs by interviewees: *"Who wants to see anyone else's shit. I mean, there's so much self-importance out there and a lot of it is trash"* (R_195) and the private nature of images shared online prompted interviewees to reject the concept of preserving social media content: *"I would never want to*

give my family my Facebook account" (R_90). There was also some uncertainty regarding the "truth" of curated digital photographs on social media platforms and constructions of self.

> *I feel like probably the back and forth in the [social media] interface gives more context. But I'm also aware that probably if you saw my unedited pile of photos you'd learn more about me. I'm aware that what I put on Facebook presents a version of myself. I've had people come up to me and say, "I saw your summer was like this..." and I said, "my summer was so boring" and their like, "not on Facebook" and I'm like, "oh I guess you're right." On Facebook it looks like I did these things but it's not actually what I was doing, or whatever, you know. But I think it would be two different views of my life* (R_35).

> *So, I think it might be more difficult for archivists and people in general over time to find things of true value on social media and of course that's a subjective statement because what is of true value, that's relative isn't it* (R_268).

Several interviewees shared concerns about the TOU of social media service providers and the implications over time for access to members' accounts: "*A lot of times the way that analogue [film-based] photo albums are passed down is that grandma dies and you find it in her closet. Retrieving images from a Facebook account without login information is impossible, so that right there is a huge obstacle"* (R_90), particularly in instances where the platform goes out of business: "*If Facebook shut down right now they have a complete right to just delete everything. They don't have to tell you, they don't have to listen to you. They own it—you know it is theirs. If*

they choose to shut down and delete all your images—oh well, all gone, 'goodbye, see ya'"(R_336) or the providers change their business model.

> *I mean unless there were to be some sort of international project to archive social media images… I think if we leave it up to corporations, it's in jeopardy at any given moment for whatever reasons. It may be that it could be used in the future in ways that we don't want it to be used, or it could just be dumped at some point because it doesn't suit the profit motives of the corporation anymore to keep it* (R_215).

5.4 Discussion

At the outset of the interview study, four goals (IG1, IG2, IG3, and IG4) were identified based on the research questions and emergent issues from the prior survey study. The following discussion addresses these goals and the patterns that have emerged from the interview data.

The **first goal (IG1)** was to explore the differences and/or similarities between individuals' activities of creating, sharing and storing and preservation of film photography and contemporary digital photography. The emergent question from the survey findings regarding participants' perspectives on the issue of privacy in regards to sharing personal photographs, contrasting previous film-based practices of sharing with current digital practices was also explored.

The interview findings reveal that the key difference between film-based photography and digital photography involving mobile/smartphones and social media platforms is constituted of the

increased volume of digital photographs and the frequency of taking digital photographs and sharing them with others. These attributes of digital photographic practices are due in part to the availability and omnipresence of mobile/smartphones with high quality imaging capabilities and connectivity with social media platforms for instantaneous dissemination of digital photographs to multiple social media communities at no perceived cost.

When contrasting the approaches to creating, managing and storing film-based photography with those related to digital photography, the interview findings reveal similarities; in which individuals actions are shaped by available capture devices and third-party services. For example, film-based practice is described as a process of: creating photographs in terms of film frames (24 or 36) and camera capabilities; developing negatives and photographic prints in terms of photo-finishing services, which produces envelopes filled with negative sleeves; and managing and storing photographs in terms of inscribing the date and location or subject/event on the exterior of the envelope and arranging collections chronologically in boxes. Digital practice is described as a process of: creating photographs in terms of iPhone capabilities and social media platform presentation parameters; downloading image files in terms of iPhoto software, which provides digital folders filled with images; and managing and storing photographs in terms of adding metadata, naming folders with subject and date, and leaving copies of photographs collections on personal devices, backed up to external drives or cloud-based services.

Interviewees admitted to neglecting potentially important activities aimed at maintaining access and protecting digital photographs collections held on personal devices, which caused feelings of

anxiety and guilt. However, all the interviewees did store copies of their digital photographs and backup these copies to external hard drives, and/or cloud-storage services. A couple of the interviewees used Flickr as a secondary backup. In contrast, hardly any of the interviewees took actions to make copies of their digital photographs held on social media platforms and store those copies.

The interview findings reveal that most individuals are members of multiple social media communities. The reasons for sharing photographs across a number of different platforms are predicated on different uses, such as business or personal; different intentions, such as instantaneous or permanence; and the degree of interest and interactivity provided by other social media member in response to postings.

The interview findings reveal that the immediacy of sharing digital photographs through social media platforms has introduced the opportunity for personal photographs to become public. Unlike earlier activities of sharing photographic prints and viewing physical photo-albums, which typically involved physical presence and a relationship with and/or knowledge of the people viewing the images, sharing through social media platforms is potentially a publication activity to a very large and unknown audience. Concerns ranged from protecting personal privacy (both personal information and content of digital photographs) to protecting the privacy of individuals represented as subjects in the digital image, particularly children and women, and personal information held in deceased members' accounts.

The **second goal (IG2)** was to explore individuals' processes for adding metadata to their digital photographs before upload into the social media platform, and to gain an understanding of individuals' perceptions of the importance of adding metadata to digital photographs. The emergent question from the survey regarding the actions of individuals to remove metadata prior to upload was also explored.

The interview findings reveal that many individuals are involved, to varying degrees, in routine practices of adding descriptive information to filenames and folders, such as date, event/subject and location, as well as in more advanced approaches of embedding user-generated metadata into image files. In the latter case, both amateur and professional practices rely on imaging software (e.g., iPhoto, Lightroom, Photo Mechanic) to assist in the addition of metadata and to perform automated tasks of tagging persons using facial recognition tools. More advanced features of imaging software enable some interviewees to create metadata templates for application of descriptive information to batches of digital images during import procedures. Overall, these actions are aimed at identifying the context of creation of digital images and managing growing volumes of digital collections stored on personal computers.

The **third goal (IG3)** was to explore individuals' processes for adding social metadata (e.g., comments, hashtags, ratings, likes etc.) to their digital photographs after upload to the social media platform, and to gain an understanding of individuals' perceptions of the importance of adding social metadata to digital photographs. The emergent question from the survey regarding the participants' awareness of social media platforms stripping-out metadata upon download was also explored.

The interview findings reveal that most individuals add social metadata as part of their process of posting digital photographs to social media platforms for the primary purposes of adding context to photographs and engaging with other members in storytelling. Most interviewees described the activity of adding comments, tags, ratings and/or likes as a necessary part of the sharing process, one which adds value to the digital photograph and helps anchor it in the sea of flowing data online. It became clear during the interviews that, overall, the addition of textual information to digital photographs after upload into social media services is primarily a social activity, and the type of information shared is determined by the features and functionality of the platform, and the attention provided by the social media community.

The **fourth goal (IG4)** was to explore in greater depth individuals' perceptions of the benefits and/or obstacles of social media platforms to the preservation of digital photographs collections for future generation, and individuals' plan to pass down their digital photographs collections to future generations. The emergent question from the survey regarding participants' perspectives of the relationship between the copies of digital photographs collections stored on personal devices and the digital photographs collections shared and stored on social media platforms, in order to determine where images attributed with long-term value might reside was also explored.

The interview findings reveal that the primary benefits introduced by social media platforms to the preservation of digital photographs collections for future generations is as distributed storage of multiple copies and as secondary backup for personal digital archives. In contrast, interviewees identified the key obstacles introduced by social media platforms to the

preservation of digital photographs collections for future generations as the risk of loss due to a lack of provisions in service providers' TOU for restoration of user-generated content in the case of discontinued social media services and changes in service models. As a result, many individuals prefer to store their digital photographs collections on devices and hardware that is physical and under their control. Several opinions and experiences were shared regarding cloud-based storage services that raise questions about the reliability of these services and suggest that the technology is still relatively new to most social media members.

The relationship between the digital photographs stored on personal devices and those stored on social media platforms was explored by interviewees in the context of what they would pass-on to future generations. Most interviewees discussed giving access to their personal computer or external hard drives; whereas, others considered curating a selection of the best images stored on their personal computers. The language used by interviewees when talking about the digital photographs stored on their personal computers vs. social media platforms suggests that the online collections are publications or copies. In contrast, the digital image files stored on their personal computer and external hard drives (and the Cloud) were referred to as archives, in the backup sense of the word.

The interview findings reveal that most individuals don't have a plan for assigning control over accounts and content to a beneficiary, either for the purposes of access or deletion. Only one participant had plans in place for providing access to social media accounts and that was due to his experience with receiving a request to "friend" a deceased family member. Throughout discussions on long-term preservation of digital photographs held on social media services, the

interviewees expressed criticism of social media providers' policies regarding ownership and licensing of user-generated content. In most cases the individuals were not accurate in their understanding of the current TOU. The interviewees who have a professional practices and are using social media services for business purposes were the most informed about issues of ownership and licensing, and also the only interviewees that mentioned needing a lawyer to understand the TOU. "*I have yet to find a lawyer that can completely explain it to me*" (R_339).

5.5 Conclusion

The interviews provided the opportunity to explore issues raised in the survey study in more depth and generated new questions for consideration. This chapter has presented the results of the interview study and a discussion of the findings. The next chapter will draw together the significant findings of the survey study and the interview study, providing an opportunity to connect the two phases of research in the context of the research questions. Lastly, implications of the main findings will be discussed in relation to archival science, followed by recommendations for future research, practice and policy.

Chapter 6: Discussion

The previous chapters presented the results and provided a discussion of the findings of the web-based survey and the semi-structured interviews. This chapter will discuss the main findings of this research against the four research questions and follow-up research questions. The chapter will then identify implications of this study for archival science and will provide recommendations for future research, practice and policy. Lastly, the contributions of this research will be addressed along with final thoughts.

6.1 Discussion of Main Findings

One of the propositions of this study was that the widespread adoption of mobile devices, including smartphones for making digital photographs and transmitting them to social media platforms for sharing and storage, is introducing new social practices, technological processes and legal contexts for record-making and recordkeeping, which impact the trustworthiness of digital photographs. The survey and interview findings support this.

Research Q.1: What is the primary purpose that individuals are using photo-sharing and social networking sites for, in regards to their digital photographs?

> *Follow-up Research Q.1: To what extent do contemporary photographic practices involving mobile/smartphones and social media platforms differ from earlier film-based practices?*

The survey findings reveal that individuals' primary use of social media platforms in regards to their photographic practice is for sharing personal photographs across multiple social media platforms. The interview findings reveal an emphasis of contemporary digital practice is on sharing images in real time and through platforms that emphasize instantaneous viewing and encourage user-contributed comments, such as Instagram. These findings agree with the conclusions drawn by Van House that there is no lag-time between creating the digital photograph and its use, making personal photographs a means of quick, short-term communication between friends (Van House 2011, 128). The findings of this study extend existing research by Van House on personal photography through its exploration of practices of sharing by both professional and amateur photographers across multiple social media platforms. In the study discussed in this dissertation, the interviewees had a broader purpose than simply sharing with friends. The combination of immediacy in capture and sharing, along with the global reach of social media platforms, encourages individuals to merge personal, business and leisure activities into a singular photographic practice and to seek social media platforms that can meet specific needs and integrate easily with existing capture devices and imaging applications.

Building on the survey findings that individuals share their digital photographs across multiple social media platforms, the interviews reveal the influence of specific social media platforms on the type of digital photographs shared, the amount of contextual metadata associated and shared with the image, and the quality of interaction between

members. When there is more than one social media account, individuals curate their photographs to suit a particular platform and its associated audience. In terms of digital photographs collections, individuals shared their perceptions of: Facebook as the digital shoe box, a place where personal snapshots are shared with family and close friends, but the image metadata is removed and the social metadata is not that relevant; Flickr as the framed pictures on a wall, a place where artistic creations are shared with professionals and amateur photographers interested in discussing the aesthetics of photography, and a reliable place for storing images with associated image metadata; and Instagram as something altogether different, a place for storytelling with images and text (social metadata) and sharing with as many people as possible. These findings contribute to the conclusions drawn by Lindley et al. in the HCI study of managing and controlling personal digital content hosted online (2013). Lindley et al. found that participants perceived different sites as separate and distinct in meaningful ways (Lindley et al. 2013, 8).

The survey findings reveal that sharing is the primary purpose that individuals use social media platforms in regards to their digital photographs. The interview findings reveal that the extent to which film-based practices differ from contemporary digital practices is most notably in the massive increase in the amount and frequency of images being shared. Individuals are no longer limited by cost, development time, or proximity. Social media platforms provide individuals with features to support instantaneous sharing, storytelling tools and simultaneous connections with friends, family, the larger social media community, or the open Web. As a result, social media

members' are concerned with issues of privacy. Unlike earlier film-based practices, in which individuals could easily control access to their personal photographs through limiting who they shared them with, social media services control access through a combination of privacy settings and types of sharing activities, the rules of which are not made explicit to users upon joining the services.

Research Q. 2: Are individuals who use photo-sharing and social networking services to store their digital photographs concerned with trustworthiness?

> *Follow-up Research Q.2: To what extent do contemporary photographic practices impact the reliability and accuracy of digital photographs?*

The survey findings reveal that individuals are engaged in activities of adding metadata to their digital photographs prior to upload into social metadata platforms that contribute to the trustworthiness of digital photographs. The interviews explored practices of adding technical and descriptive image metadata in greater depth. The interview findings reveal that individuals manage the flow of digital image files from smartphones to various devices and online services through routine actions supported by imaging workflow software, such as iPhoto and mobile apps. Actions range from minimal, such as designating folders and naming files, to more robust, such as adding identity metadata to digital image files (e.g., location, date, subject, photographer name, and title) and making copies for offline or cloud-based storage. Individuals perform these processes to ensure accurate discovery and efficient retrieval of digital

photographs stored within large and potentially sprawling collections. The interview findings also reveal that at times, individuals add image metadata for management purposes and then remove image metadata for sharing purposes. Therefore individuals are not explicitly concerned with the trustworthiness of their digital photographs stored on photo-sharing and social networking services, but they are performing activities as part of their digital practice that establish the reliability and accuracy of their digital photographs prior to sharing in social media platforms.

These findings disagree with those of Van House (2009). In her study, participants were overwhelmed by the volume of digital photographs collections and put little effort towards organization, relying mainly on dates to find image files stored locally (Van House 2009, 1078). The differences in these findings can be attributed to the research population and available tools. The study for this dissertation included individuals who describe their photographic practice as professional, or both professional and amateur; and a number of improvements have been made to imaging workflow software and mobile apps over the past five year, including better integration with smartphones and more support for technical and descriptive image metadata.

In order to determine the extent to which contemporary photographic practices impact the reliability (i.e., the trustworthiness of a digital record as a statement of fact, that is, as to its content) and accuracy (i.e., the trustworthiness of the data within a digital record, including colour space, size etc.) of digital photographs requires knowledge of

the actions being taken by individuals to link additional information to digital image files at the time of generation and/or during management of digital collections. The interview findings reveal that many, but not all interviewees are aware of the technical metadata (i.e., Exif) that are automatically captured by digital devices (e.g., geo tag) and either exploit this information for management and sharing purposes, or remove this information to protect privacy in the networked environment. In some cases, participants adjusted the settings of their smartphones to ensure that their digital photographs were not tagged with geographic location metadata.

The technical metadata automatically captured by digital devices and the descriptive metadata added by interviewees contribute to establishing the reliability and accuracy of digital photographs, as long as that information remains inextricably linked to the digital files. The name of the photographer (i.e., author), date, location, subject/event, and the names of persons represented in the image are attributes of identity and can be used to determine the provenance of the visual record and ensure its reliability. Several interviewees discussed instances in which reference to the digital image's technical metadata (e.g., aperture, GPS) supported their photographic practice and provided evidence that the digital image was not manipulated. There were also discussions during the interviews about the transformation in size, colour and resolution of digital photographs when sharing across multiple platforms. These types of activities are a consequence of contemporary sharing practices and place the reliability and accuracy of digital photographs at risk.

Research Q.3: Are individuals aware of the risks posed by social media platforms to the trustworthiness of their digital photographs collections?

> *Follow-up Research Q.3: To what extent do social media providers' policies and procedures for managing and storing digital photographs in social media platforms influence the authenticity (i.e., identity and integrity) of digital photographs?*

The survey findings reveal that some individuals are aware of the risks posed by social media platforms to the trustworthiness of their digital photographs collections through experiences with technical and descriptive metadata being removed by actions of uploading images to social media sites and social metadata being removed by actions of downloading images from social media sites to personal computers. The interview findings reveal that policies and procedures for managing and storing digital photographs are relatively unknown to social media users.

Many describe the importance of captions, titles and hashtags associated with digital photographs to attract public attention and encourage interaction with other social media members. Individuals are aware that adding information to their digital photographs is a method of providing context and that this is important for photographs because their intended meanings may not be understood simply by looking at the image content. The actions undertaken by individuals to add social metadata to their digital photographs shared on social media platforms provide

contextual information about the circumstances of creation as well as the use of the digital photographs. However, the relationship between these elements is not always supported during actions of downloading digital photographs out of social media platforms.

There are a number of factors that need to be considered when determining the authenticity of digital photographs shared and stored on social media platforms. An authentic digital photograph maintains the same identity it had when first generated, and can be proven to have maintained its integrity over time. The identity of a digital photograph is the whole of the attributes that distinguish it from any other digital photograph, and is assessed on the basis of its external appearance and its metadata. The integrity of a digital photograph refers to its completeness and its ability to convey the same message it was intended to communicate when generated. It is inferred from its appearance and the circumstances of its maintenance and preservation, as attested by a demonstrable chain of custody and integrity metadata. Analysis of the interview data reveals that social media members are relying on technical and descriptive metadata to identify digital photographs stored on personal devices and shared on social media platforms.

It was suggested by interviewees that more members would utilize embedded identity metadata if they could be assured that the procedures for uploading and managing digital photographs in social media platforms would not strip-out contextual information and alter the external appearance (e.g., size, resolution, colour etc.).

If the digital photograph stored on a personal computer is considered a record, then actions performed by social media service providers during upload, management and download significantly impact the identity of digital photographs by removing contextual and representational information. Furthermore, as photographs communicate their message through their appearance, any alteration would significantly impact the integrity of the digital photograph as well. Thus, social media service providers' current policies and procedures for managing and storing digital photographs in platforms do not protect record authenticity.

Analysis of the interview data also reveals that the comments, tags, likes and ratings linked to digital photographs through the social media interface as part of sharing activities are considered by some interviewees as elements that transform the digital photograph into something more. It was suggested by interviewees that the combination of text and image presented in the social media platform is a result of platform features and member interactivity. The combination of image and text, as well as the engagement between members is referred to as storytelling. If the digital photograph presented in the social media interface with comments etc. is considered a record, then actions performed by social media service providers during management and download significantly impact the identity of digital photographs by removing contextual and representational information. As noted earlier, because photographs communicate their message through their appearance, any alteration, including removal of the image from the presentation layout, would significantly impact the

integrity of the digital photograph as well. Thus, even if one recognizes the online version of a digital photograph as a record, social media service providers' current policies and procedures for managing and storing digital photographs in platforms do not protect its authenticity.

Research Q.4: Are individuals who use photo-sharing and social networking sites aware of the challenges presented by social media platforms to continuing access and long-term preservation of digital photographs collections?

Follow-up Research Q.4: What are individuals' perceptions about the continuing access and long-term preservation of digital photograph collections on social media platforms?

The survey findings revealed that most individuals skim social media providers' policies and procedures presented in the Terms of Use (TOU) prior to joining the social media service and that they tend to focus on the Terms of Service and the Privacy Policy. The interviews provided an opportunity to gain a better understanding of members' knowledge of the TOU and the policies and procedures described within, by revealing that most individuals are not informed as to social media providers' policies regarding ownership, or the licensed use of shared and stored digital photographs by the service provider. Many study participants made statements that revealed their limited knowledge of the admittedly complex TOU. There were a number of times throughout the interviews that individuals spoke critically about the

imbalance of power between social media corporations and the individuals sharing content through the services; yet, there were only a couple participants who spoke with confidence about the TOU, and even then their comments were limited to certain aspects of the service agreement, such as licensing or termination of accounts.

The fact that TOU are lengthy and complex; and neither stable nor consistent across services, ensures that individuals are not going to spend the time to familiarize themselves with the social media providers' policies and procedures. As a result, most individuals are unaware of the role and responsibility of the service provider, and the degree of control members have, or not, over their personal information and digital photographs collections now and in the future. These findings agree with conclusions drawn by Marshall and Shipman in HCI studies exploring individuals' attitudes about the value, ownership and control of social network data (2014, 2015). Marshall and Shipman found that users sign license agreements to gain access to social network services without reading the TOU first, and this leads to a lack of knowledge about ownership of user-generated content and sustainability of the service (Marshall and Shipman 2014, 9).

In order to determine the extent to which individuals' perceptions of ongoing access to their social media collections impact the authenticity (i.e., identity and integrity) of digital photographs requires knowledge of the actions being taken (or not) by individuals to ensure a chain of legitimate custody, particularly after the death of the creator. The survey findings revealed that individuals have expectations of ongoing

accessing to their digital photographs collection shared on social media, but very few have taken practical steps to ensure access to accounts or shared content. The interviews provided an opportunity to explore study participants' perceptions about long-term preservation of their social media photographs in greater depth. The interviews revealed that most individuals had yet to consider legacy planning for their digital photographs collections, both offline and online. For many study participants the question was interesting to them, but not something they had spent much time thinking about, let alone planning for. The interview findings revealed that most individuals would rather curate a selection from the digital photographs stored on personal devices to give to their children and/or provide full access to their external hard drives and personal computers; than allow anyone to inherit their social media accounts and contents. Comments made by study participants during the interviews about assigning a beneficiary to access social media accounts after death of the creator supported the survey data in which individuals had not taken steps towards safeguarding future access to their accounts. One issue that was not explored by any study participant was providing access to a beneficiary for the purposes of deleting an account and removing the shared content.

The interview findings also revealed that some individuals do not want to designate a beneficiary for their social media accounts due to concerns about protecting personal privacy from both the social media service provider and the general public. These same individuals were comfortable with providing access to digital photographs collections stored on personal computers and external hard drives, but not to their

social media accounts. A number of study participants discussed their concerns about social media providers monetizing members' personal information, online behaviours and digital photographs; yet, these practices are not significant enough to cause individuals to close their accounts and stop sharing digital photographs on social media platforms. The interview findings show that individuals are critical of social media providers' current activities and suspect that future activities will be aimed at making more profit off of members, but this doesn't affect their allegiance to social media services at this time. Others proposed that archival institutions concerned with preserving social media content should contact government security and intelligence agencies and ask for copies of the data collected as part of surveillance operations. These findings agree with conclusions drawn by Marshall and Shipman in their HCI studies, in which individuals supported the concept of monetizing their own social network data, but did not support monetization by the corporate service provider (Marshall and Shipman 2015, 11).

6.2 Implications for Archival Practice

6.2.1 Creation and Management

The magnitude of the quantity of digital photographs being generated by individuals presents for a high probability of loss if individuals are unable to manage and organize their visual collections in a quick, meaningful and persistent manner. Archivists should support creators in choosing devices, software and services that are interoperable and reinforce good practices of born-digital image creation and management. Clearly, individuals use commercially available technologies and tools

to capture digital images and manage the dissemination of copies to different social media services. If creators are not encouraged and assisted in the routine creation of unique file-names, folder hierarchies and embedded image metadata, there will be lasting implications for them as well as for preservers.

Archivists are all too familiar with the challenges of acquiring personal and organizational fonds that include large numbers of photographs without any discernible system of arrangement or descriptive information about the circumstances of their creation and use. If the photographs are physical prints, there is a possibility that identity information, such as date, location, names of people represented in the photograph, and name of photographer etc. be recorded on the back. If the photographs are born-digital images and can be rendered, there is a possibility that Exif and IPTC metadata embedded in the file header can be extracted and read using existing digital preservation tools that do not alter the record. Unless creators are supported in their efforts to capture and manage digital photographs and associated metadata, their collections will quickly grow beyond their control and become vulnerable to neglect and loss. In circumstances where these digital photographs are shared through social media platforms, the only contextual information will be that which is added through the platform as social metadata.

When archives appraise organizational or personal fonds that contain terabytes of unorganized digital images deplete of contextual information, they must balance the potential value of the fonds with the resources, expertise and funds available to

arrange, describe and preserve it. Furthermore, as archives use the Web and social media platforms to make digital copies of their archival holdings available, they must consider legal requirements of copyright clearance and protection of privacy prior to sharing or providing access. Both metadata and archival description introduce the opportunity for privacy to be infringed upon.

6.2.2 Sharing and Use

Individuals identify sharing digital photographs as their primary use of social media platforms and the most important features of a site as that of supporting sharing. Not all individuals are interested in engaging with other members through comments, but most believe that the application of contextual information to digital photographs posted on social media platforms is vital to conveying the photographer's intent behind capturing and sharing the image. Additionally, social metadata contribute to the ongoing use of digital photographs in the online context, and capture social interactions between members. In most TOU, comments and hashtags are considered user–generated content and fall under the ownership of individuals. That being said, social metadata are not embedded into the associated digital image file. Instead, social metadata are dependent upon the presentation interface, and removal of digital photographs from the platform can sever the relationship between the image and its social metadata.

The immediacy and dynamic nature of the platform presents an opportunity for the functional context of digital photographs to be lost. Archivists should guide creators

in choosing software and social media services that support the capture and preservation of digital photographs and associated social metadata. The attribution of social metadata to digital photographs is unique to the platform environment and is contextual information that is not part of the digital image copies stored locally on individuals' personal computers and external hard drives. The tools made available by social media providers' for individuals to download their social media content do not capture the dynamic environment, and only recently have begun to include comments and hashtags. Archivists that are interested in capturing social media content related to a significant event, or a particular organization or individual, should always attempt to capture both forms of user-generated content–the digital photographs and associated social metadata.

Archivists working with digital images, video and new media artworks are becoming aware of the challenges of managing and preserving complex digital objects that rely on interactivity and proprietary operating environments to communicate their original meaning and functional context. Digital photographs shared on social media platforms are always viewed on a screen and through a browser application. When archivists appraise organizational or personal fonds that contain these types of records, they must consider the look–and–feel of the record in its original environment and any behaviour or interactivity that is integral to the intended use and meaning of the record in its original environment. Strategies for managing and preserving these types of records are based on available resources, expertise and funds. Ideally, the records are re-presented in an emulated environment (i.e., a

computer program imitating a specific application or device), which maintains the essential characteristics and/or properties of the original work.

6.2.3 Storage and Preservation

Billions of born-digital images are posted and shared on social media platforms every day. The magnitude and immediacy that characterize contemporary digital photographic practice influences perceptions that once a photograph has been shared on a social media platform it is rarely looked at again, by either the creator or members of the community. Vast quantities of digital photographs accumulate in social media accounts and are hosted by service providers for years at no cost to the creator, but members do not rely on platforms for long-term preservation. Individuals perform preservation activities on the copies of born digital images held on local devices, under their own control. In many ways, creators treat social media photographs as publications, not records.

The implications are that, over time, creators may forget or abandon social media accounts and the content stored with services to join new platforms and explore new social communities. Unless there is a strong tie between born digital images stored locally and photographs shared on social media platforms, creators will treat their digital photographs collection stored with social media services as ephemeral, with no permanent value. As a result social media companies will continue to acquire user-generated content and build massive digital repositories of personal data.

6.3 Overarching Research Question

The overarching research question for this study asks: How do we ensure the archival trustworthiness of digital photographs shared and stored on social media platforms? At this early stage, a solution based on earlier approaches to managing and preserving digital photograph collections (Bushey 2005) is inadequate due to the social and technological changes brought about by contemporary photographic practices involving mobile/smart phones and social media platforms.

The commercially available devices, software and online systems that support individuals in the creation, management, sharing and storing of their personal digital photographs are not capturing and maintaining the necessary attributes of digital image files and linked metadata throughout the record lifecycle to establish and sustain the trustworthiness of digital photographs over the long term. The procedures for uploading and downloading digital photographs into and out of social media platforms significantly impact the trustworthiness of digital photographs by altering image file formats and data (impacts accuracy); removing technical and descriptive metadata added during creation and management (impacts reliability); and removing technical and social metadata added during online activities of sharing and storage (impacts authenticity). Individuals' perceptions of social media platforms as publication services with varying degrees of privacy has resulted in practices of accumulating versions of personal photograph collections across multiple online applications, as well as offline devices; yet, without designating the authoritative

version or assigning a chain of legitimate custody for ongoing stewardship of a particular collection.

The following recommendations address future research, practice and policy and are focused on supporting the creation, use and preservation of digital photographs as trustworthy records that can be relied upon to communicate the context of their creation and use, and demonstrate an unbroken chain of preservation.

6.4 Recommendations

6.4.1 Future Archival Research

The public turn in personal photography is an area of research that should be explored further, specifically its impact on digital photographs as personal possessions. By sharing personal photographs in social media platforms, individuals are entering into a complex legal situation, one which recognizes the individual as the owner of the digital photograph and linked social metadata (i.e., content), yet assigns possession of that digital content to the entity that owns the physical storage infrastructure, which could be the social media service provider or the cloud-computing service provider. These types of digital assets are referred to as intangible possessions and are treated differently by the legal system than digital photographs stored on physical devices (e.g., external hard drives) that are under the control of the creator. Future archival and legal research should focus on control over intangible possessions, including rights of inheritance and donation to public repositories.

A second area of research that could be explored further by the archival and recordkeeping community is the development, in collaboration with HCI scholars and practitioners, of a mobile application that would assist creators in capturing and managing their born-digital images in a manner which supports, at a minimum, discovery and retrieval, and, at a maximum, the creation, use and preservation of trustworthy records. For example, the mobile application CameraV (alpha version) supports robust metadata capture for digital images and videos, along with options to remove metadata to protect privacy when sharing content on social media platforms (Guardian Project 2015). CameraV uses the built-in sensors of Android smartphones to gather contextual information from the surrounding environment, and bundles it with the media file before adding encryption and a checksum and signing with a private key.[36] The mobile app is the result of collaboration between The Guardian Project and WITNESS, and is aimed at addressing the needs of journalists, human rights activists and the legal community to capture and share "verifiable" born digital images and videos. To record the metadata gathered by the smartphone sensors, the developers have used JavaScript Object Notation (JSON), an open–standard format that uses human–readable text to transmit data that is considered easier to use than Extensible Markup Language (XML). This type of mobile application seems essential to its intended audience, one that deals with the evidentiary concerns of user-generated digital content, but also needs a reliable and secure method for sharing visual documentation on social media platforms without compromising personal

[36] To record the metadata gathered by the smartphone sensors, the developers have used JavaScript Object Notation (JSON) an open–standard format that uses human–readable text to transmit data, which is considered easier to use than Extensible Markup Language (XML).

privacy. It is a useful example of how technology can be harnessed to support creators of visual documentation through a careful understanding of the circumstances surrounding record creation and management and use. Providing a mobile application that is suited to personal information management (PIM) and personal digital archiving (PDA) needs could offer an opportunity to integrate a lightweight records management and recordkeeping tool into smartphones. In light of the growing information overload, it is important that archivists and information professionals create tools that support individuals in managing their accumulations of digital photographs across online and offline platforms in meaningful ways. Thus, a method for linking versions of digital photographs that exist online and offline would provide individuals with a powerful overview of their collections and introduce the opportunity for curatorial control involving selection and deletion. Again, this type of research would require collaboration, drawing upon the strengths of archival and information studies, as well as human computer interaction, with the intention of disseminating research through software to provide a broader impact.

6.4.2 Future Archival Practice

The characteristics of digital photographs created with mobile/smart phones and shared on social media platforms will have implications for the methods used by archival institutions to provide online and in-person access to contemporary photographs. An area of archival practice that should be explored further is archival description and the creation of finding aids for discovery of and access to born-digital holdings. There are several emerging strategies for curating social media content, as

well as providing access to complex digital objects, such as new media art, that could inform archival practice. By incorporating software aimed at harvesting social media content and/or discovery and data curation tools created by other information and heritage professionals aimed at interacting with dynamic media, archivists could provide access to digital photographs and related social metadata while communicating their functional use as social media records. For example, the software application digi.me <https.//get.digi.me>, formerly SocialSafe, enables social media users to download copies of all social media posts, photographs and interactions to their personal computers (a mobile app is scheduled for release in 2016). Digi.me also provides search and retrieval tools and visual analytics to assist individuals in exploring and curating their personal data–for free (2015). Also, an open source web archiving platform and service called Webrecorder <https://webrecorder.io> is being launched by the born-digital art organization, Rhizome, with funding from the Andrew W. Mellon Foundation (2016). In response to the limitations of existing approaches to web archiving (i.e., series of static screenshots or a particular URL), Webrecorder provides the capture of interactive, contextual collections of social media, including digital photographs, embedded video and javascript. Captured content can be downloaded or viewed in the Webrecorder browser, which emulates the original environment to provide an experience that is similar to interacting (i.e., re-enacting) with the original site. The aim of Rhizome is to use Webrecorder to upgrade their organizational archives and provide the opportunity to acquire and provide access to new media artworks that are hosted by a variety of entities.

These examples clearly demonstrate the growing importance for individuals and organizations of being able to capture social media content in the context of its use online and present it to researchers in an emulated environment that reveals the digital photograph as always connected to a system or interface, rather than as a discrete complete product. As research interest in the digital humanities grows, the demand for access to born-digital archives in their original environment will increase, as will the need for tools that support discovery, retrieval and data curation. Archival description has evolved from lengthy narratives to metadata elements; perhaps it is time for another transformation, one that embraces the interactivity of contemporary communications. Understandably, there are a number of methodological, technical and legal questions raised by this type of research, which will require input from various stakeholder communities.

6.4.3 Future Archival Policy

Lastly, an approach that could be explored further by the archival and recordkeeping community is to put pressure at the policy level on social media platform providers to be more transparent in their management and storage activities. As part of their business operations, photo-sharing and social networking services are gathering staggering volumes of personal information and user-generated content, mainly for purposes of monetization. The study conducted by IPTC Embedded Metadata Group (2013, 2016) shows minimal improvement in the support provided by social media services for maintaining persistent technical and descriptive image metadata. The

study conducted by Clark (2011) on social networking sites and forensic investigations of personally identifying information in digital photographs shows that there is considerable alteration of the digital photographs residing in social media platforms, due to the actions of privacy settings, management activities of the service provider and the lack of transparency in the TOU regarding available metadata when publishing digital photographs on platforms (2011).

Therefore, the archival and recordkeeping community should put pressure on social media providers to be transparent and accountable, and support existing standard practices for image-making and recordkeeping. Simply providing options for members to store an unaltered copy of the original digital image file uploaded into the platform, along with its embedded metadata that could be available for download by the member at a later date, would be a start. The option to download both the unaltered original digital image file and any related online versions that may have been stripped of identifying metadata for privacy reasons, along with associated social metadata, to members' personal device would be the next step. This is a flattened approach to preserving social media photographs and does not include the interactivity of the operating environment, but it would allow creators and preservers access to digital photographs collections in a manner that would reveal provenance, original order and an unbroken chain of custody.

6.5 Contribution of the Research Conducted for this Dissertation

The research conducted for this dissertation is the first to ask in-depth questions of creators about contemporary photographic practice involving camera phones and social media platforms from an archival perspective. Through its empirical design and application of the concepts and methods of contemporary archival diplomatics to digital photographs, it contributes to the larger discussion of the archival trustworthiness of records in the online environment. The research offers insights into the extent to which the convergence of cameras with mobile devices with Internet connectivity to social media platforms has changed practices of digital photograph creation, management, use and storage; and shows the impact of these changes on the trustworthiness of digital photographs and photographs collections. In particular, the characteristics of convergence, connectivity, ephemerality and performance result in an increasing volume of personal digital photographs, which are being shared more frequently and with a wider audience. As a result, the role of personal photography as a private practice has taken a public turn and individuals are now sharing visual documentation of intimate moments on a global scale with millions of viewers. The research offers insights into evolving methods of engaging the public with digital images through the addition of hashtags and comments (i.e., social metadata) which are specific to the features and functions of proprietary social media applications. Furthermore, the digital image without these comments and removed from the platforms lacks context and interactivity. These findings invite a new perspective on establishing the provenance and determining the contextual relationships of digital photographs shared in social media platforms.

The research also reveals individuals' expectations of ongoing access to their digital photographs collections held in social media platforms which provide services through proprietary technologies and legal agreements that obscure the activities undertaken to manage and preserve the personal records circulating within the system. It highlights the power of Terms of Use agreements as legal barriers to ongoing access to and preservation of personal photographs due to the restrictions placed on gaining access to content held in accounts of deceased persons. The implications for legacy planning, donation and archival acquisitions are significant to the future of archival holdings.

Further, this research offers insights into the meanings and values that individuals assign to digital photographs collections, in particular, changing notions of photographic records as keepsakes with significant historical value to currency that has collective value within social networks. As a result, members do not rely solely on social media services as repositories for their active and inactive digital photographs, revealing actions of storing copies and backups of digital photographs collections on personal devices and cloud-storage services. The idea that social media platforms have become default archives is premature. The research presents individuals' perceptions of the short-term value of social media photographs and associated social metadata, but it also highlights the potential for these perceptions to change as storytelling, and the interactions between members (which are dependent upon the application interface) become more important at communicating meaning

than the isolated image. This shift in meaning making and its association with proprietary and dynamic application interfaces emphasizes the role of social media service providers and the lack of explicit policies for stewardship. The implications for archival and cultural repositories are unclear at this time. Exploring the adoption of image-making and recordkeeping standards by social media platforms is worthy of future investigation.

6.6 Final Thoughts

One of the propositions of the research conducted for this dissertation was that, without knowledge of digital image-making and recordkeeping practices, or a better understanding of creators' expectations of social media platforms and the policies of service providers, it is difficult for the archival profession to determine the challenges facing individuals and communities pursuing the preservation of their own digital archives, as well as the potential obstacles to archival and cultural heritage institutions acquiring organizational and private fonds that include large amounts of social media content. What emerged is that photography has been radically transformed by new technologies and social practices which support instantaneous capture and global dissemination. The social media photograph is an ephemeral communication, a stream of bits that defy possession, yet it continues to be received in law courts, newsrooms and archival repositories as if it were a physical object one could hold in the hand and inspect. Solutions to the problem of establishing and protecting trustworthiness require willingness on the part of archivists to innovate, engage and collaborate.

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Appendices

Appendix A : Terms of Use Comparison

	Facebook[37]	Dropbox[38]	Twitter[39]	Instagram[40]	Flickr (Yahoo Company)[41]
Agreement to Terms	By using or accessing Facebook, you agree to this Statement, as updated from time to time.	By using the Services you agree to be bound by these Terms.	By accessing or using the Services you agree to be bound by these Terms.	By using the Instagram website and Instagram service you are agreeing to be bound by the following Terms and Conditions ("Terms of Use").	(1.0) By accessing and using the Yahoo Services, you accept and agree to be bound by the terms and provision of the TOS.
Ownership of Images	(2.0) You own all the content and information that you post on Facebook, and you control how it is shared through your privacy and application settings.	You retain full ownership of your stuff. We don't claim any ownership to any of it.	(5.0) You retain your rights to any Content you submit, post or display on or through the Services.	(3.1) Instagram does not claim any ownership rights in the images or works of authorship that you post on or through the Instagram Services.	(9.0) Yahoo does not claim ownership of Content you submit or make available for inclusion on the Yahoo services.
Intellectual Property License	(2.1) For photos and videos covered by IP, you grant Facebook a non-exclusive, transferable, sub-licensable, royalty-free, worldwide license to use any IP content that you	These Terms do not grant us any rights to your stuff or intellectual property except for the limited rights that are needed to run the Services. This	(5.0) By submitting, posting or displaying Content on or through the Services, you grant us a worldwide, non-exclusive, royalty-free license	(3.1) By displaying or publishing ("posting") any Content on or through the Instagram Service, you hereby grant to Instagram a non-exclusive, fully paid and royalty-free,	(9.0) Content you submit or make available for inclusion on publicly accessible areas of the Yahoo Services, you grant Yahoo a worldwide, royalty-free and non-exclusive license(s). (9.b) Photos, graphics,

[37] Facebook, "Terms," *Wayback Machine*, June 15, 2012, available at: https://web.archive.org/web/20120615024416/http://www.facebook.com/legal/terms.
[38] Dropbox, "Terms," *Wayback Machine,* March 26, 2012, available at: https://web.archive.org/web/20120610220613/https://www.dropbox.com/privacy#terms.
[39] Instagram, "Terms," June 18, 2012, available at: https://www.instagram.com/about/legal/terms/before-january-19-2013/ .
[40] Twitter, "Terms," June 25, 2012, available at: https://twitter.com/tos/previous/version_7?lang=en.
[41] Flickr, "Terms," March 16, 2012, available at: https://policies.yahoo.com/us/en/yahoo/terms/utos/index.htm

	post in connection with Facebook. This IP License ends when you delete your IP content on your account unless your content has been shared with others, and they have not deleted it.	permission also extends to trusted third parties we work with to provide the Services, for example Amazon, which provides our storage space.	(with the right to sublicense) to use, copy, reproduce, process, adapt, modify, publish, transmit, display and distribute such Content in any and all media or distribution methods (now known or later developed). Such additional uses by Twitter, or other companies, organizations or individuals who partner with Twitter, may be made with no compensation paid to you with respect to the Content that you submit, post, transmit or otherwise make available through the Services.	worldwide, limited license to use, modify, delete from, add to, publicly perform, publicly display, reproduce and translate such Content, including without limitation distributing part or all of the Site in any media formats through any media channels, except Content not shared publicly ("private") will not be distributed outside the Instagram Services.	audio or video you submit or make available for inclusion on publicly accessible areas of the Yahoo Services other than Yahoo Groups, the license to use, distribute, reproduce, modify, adapt, publicly perform and publicly display such Content on the Yahoo Services solely for the purpose for which such Content was submitted or made available. This license exists until you remove or Yahoo removes such Content from the Yahoo Services, at which time it is terminated.
Public Access to Images	(2.4) When you publish content or information using the Public setting, it means you are allowing everyone, including people off of Facebook, to access and use that information, and	The Services provide features that allow you to share your stuff with others or to make it public.	(1.0) The Content you submit, post, or display will be able to be viewed by other users of the Services and through third party services and	By using our Service you understand and agree that we are providing a platform for you to post content, including photos, comments and other materials, to the	(9.0) Publicly accessible areas of the Yahoo Services are intended by Yahoo to be available to the general public, including Flickr, which is open to both members and visitors.

	to associate it with you (i.e., your name and profile picture).		websites (go to the account settings page to control who sees your Content).	Service and to share User Content publicly.	
Associating Images with Advertising	(10.1) You can use privacy settings to limit how name and profile picture may be associated with commercial content served by Facebook. You give Facebook permission to use your name and profile picture in connection with that content, subject to the limits you place.	N/A	(5.0) You agree that the license includes the right for Twitter to make Content submitted to or through the Service available to other companies, organizations or individuals who partner with Twitter for the syndication, broadcast, distribution or publication of such Content on other media and services, subject to our terms and conditions for such Content use.	(3.2) Some do the Instagram Services are supported by advertising revenue and may display advertisements and promotions, and you hereby agree that Instagram may place such advertising and promotions on the Instagram Service or no, about, or in conjunction with your Content. The manner, mode and extent of such advertising and promotions are subject to change without specific notice to you.	N/A
Sharing Account Information	(4.8) You will not share your password. (4.9) You will not transfer your account to anyone without first getting written permission from Facebook.	N/A	N/A	N/A	(5.0) You are responsible for maintaining the confidentiality of the password and account and are fully responsible for all activities that occur under your password or account.
Removal of Content	(5.2) We can remove any content or information you post on Facebook if we believe	We may remove any content from our Services at our discretion and	(9.0) We reserve the right to remove Content alleged to infringing without	(2.5) We may, but have not obligation to, remove Content and accounts containing	(6.0) Yahoo and its designees shall have the right in their sole discretion to pre-screen, refuse, or

	that it violates this Statement or our policies.	without prior notice to you.	prior notice, at our sole discretion, and without liability to you.	Content that we determine in our sole discretion are unlawful, offensive, threatening, libelous, defamatory, obscene or otherwise objectionable or violates any party's intellectual property or these TOU. (3.7) Instagram reserves the right to delete any Content for any reason, without prior notice.	remove any Content that is available via the yahoo Services.
Account Termination	(15.0) If you violate this Statement, or create risk for Facebook, we can stop providing all or part of Facebook to you. We will notify you by email or at the next time you attempt to access your account.	We reserve the right to suspend or end the Services at any time, with or without cause, and with or without notice.	(9.0) Twitter will also terminate a user's account if the user is determined to be a repeat infringer without prior notice. (10.0) If you stop using the Services without deactivating your accounts, your accounts may be deactivated due to prolonged inactivity. We may suspend or terminate your accounts or cease providing you with all or part of the Services at any time for any reason. We will make	(2.1) We reserve the right to modify or terminate the Instagram service for any reason, without notice at any time.	(15.0) You may terminate your Yahoo account by submitting a termination request to Yahoo. You agree that Yahoo may, without prior notice, immediately terminate, limit your access to or suspend your Yahoo account and access to Yahoo Services.

			reasonable efforts to notify you by the email address associated with your account or the next time you attempt to access your account.		
Modify Terms of Service	(14.1) We can change this Statement if we provide you notice by posting the change on the Facebook Site Governance Site and provide you with an opportunity to comment. You must "like" the Facebook Site Governance Page to receive notice of any future changes to TOU. (14.4) If we make changes to policies reference in or incorporated by this Statement, we may provide notice on the Site Governance page. (14.6) Your continued use of Facebook following changes to our terms constitutes your acceptance of our amended terms.	We may stop, suspend, or modify the Services at any time without prior notice to you. We may revise these Terms from time to time and the most current version will always be posted on our website. If a revision, in our sole discretion, is material we will notify you. Other changes may be posted to our blog or terms page, so please check those pages regularly. By continuing to access or use the Services after revisions become effective, you agree to be bound by the revised Terms.	(1.0) The Services that Twitter provides are always evolving and the form and nature of the Services that Twitter provides may change from time to time without prior notice to you. (12.C) We may revise these Terms from time to time. If the revision, in our sole discretion, is material we will notify you via an @Twitter update or e-mail to the email associated with your account. By continuing to access or use the Services after those revisions become effective, you agree to be bound by the revised Terms.	(2.2) We reserve the right to alter these Terms of Use at any time. If the alterations constitute a material change to the TOU, we will notify you via internet mail according to the preference expressed on your account.	(1.0) Yahoo provides the Yahoo Services to you subject to the following Terms of Service, which may be updated from time to time without notice to you.

Dispute Resolution	(16.1) You agree to submit to personal jurisdiction of the courts located in Santa Clara County, California.	All claims arising out of or relating to these Terms or the Services must be litigated exclusively in the Federal or State Courts of San Francisco County, California, and both parties consent to venue and personal jurisdiction there.	(12.B) All claims, legal proceedings or litigation arising in connection with the Services will be brought solely in the federal or state courts located in San Francisco County, California, United States.	(11.0) You and Instagram agree to submit to the personal jurisdiction of the courts located within the county of Santa Clara, California.	(28.0) You and Yahoo agree that the TOS and the relationship between the parties shall be governed by the laws of the State of California.
Deceased Member Accounts[42]	To protect the privacy of people on Facebook, we cannot provide anyone with login information for accounts. To remove a deceased person's account or for memorialization, submit a request including information about the deceased, person's date of death, and verification of your relationship to the deceased.	These Terms create no third party beneficiary rights. To request access to the account of someone who has passed away, you'll need to provide documentation that the person is deceased and you have a legal right to access the person's files under all applicable laws. Submit the full name do the deceased and email address associated with their	We are unable to provide account access to anyone regardless of his or her relationship to the deceased. To request the removal of a deceased user's account, submit a request including information about the deceased, a copy of your ID, and a copy of the deceased's death certificate.	(5.8) In the event of the death of an Instagram User, please contact us to request that the account is memorialized or if you are an immediate family member of that person, you can request the account be removed from Instagram. We can't provide login information for a memorialized account. It's always against our policies for someone to long into another person's account. To memorialize account	(28.0) No Right of Survivorship and Non-Transferability. You agree that your Yahoo account is non-transferable and any rights to your Yahoo ID or contents within your account terminate upon your death. Upon receipt of a copy of a death certificate, your account may be terminated and all contents therein permanently deleted.

[42] In 2012, only Flickr had a clause addressing termination of accounts for deceased members. The information included in this section has been drawn from TOS dated 2016. See, Facebook, "Terms," 2016, https://www.facebook.com/help/contact/228813257197480; Dropbox, "Terms," 2016, https://www.dropbox.com/en/help/488; Twitter, "Terms," 2016, https://support.twitter.com/articles/87894#; and Instagram, "Terms," 2016, https://help.instagram.com/264154560391256/.

		Dropbox account, your information and relationship to the deceased, a copy of your government-issued ID, and a valid court order establishing that it was the deceased person's intent that you have access to the files in their account after the person passed away and that Dropbox is compelled by law to provide the deceased person's files to you.		you must provide proof of death. To remove an account you must provide the deceased person's birth certificate and death certificate, as well as proof of authority under local law that you are the lawful representative of the deceased person, or his/her estate.	

Appendix B : Invitation to Survey

An invitation to participate in the survey of The Trustworthiness of Digital Photographs Accessed and Stored in Social Media Platforms was shared on a number of different photo-sharing and social networking sites, through personal accounts owned by the researcher. The invitation was also posted to 2 photography listservs and Mechanical Turk, and included in two articles written by others. In some cases, the invitation to participate was reposted by other social media members (see Figure 3 and Figure 4). The invitation posted by the researcher always included a hyperlink to the web-based survey, which led potential participants to the hosted survey landing page where potential participants could read about the survey, its purpose, procedure etc. and give their consent prior to starting the actual survey questionnaire (see Figure 5). Every participant had to give consent prior to starting the survey.

Twitter http://twitter.com

Twitter is a social networking service that enables members to exchange messages (i.e., Tweets), which may contain photos, videos, hyperlinks and up to 140 characters of text.

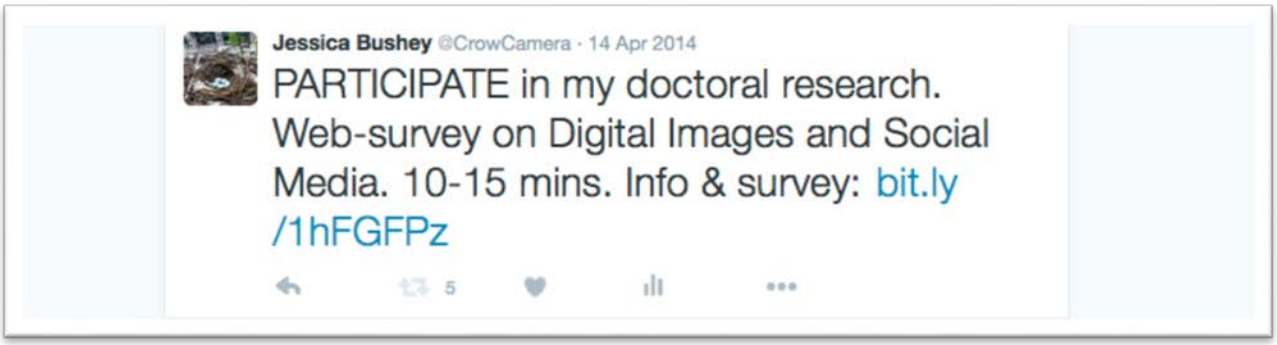


Figure 3 - Invitation to Survey on Personal Twitter Account

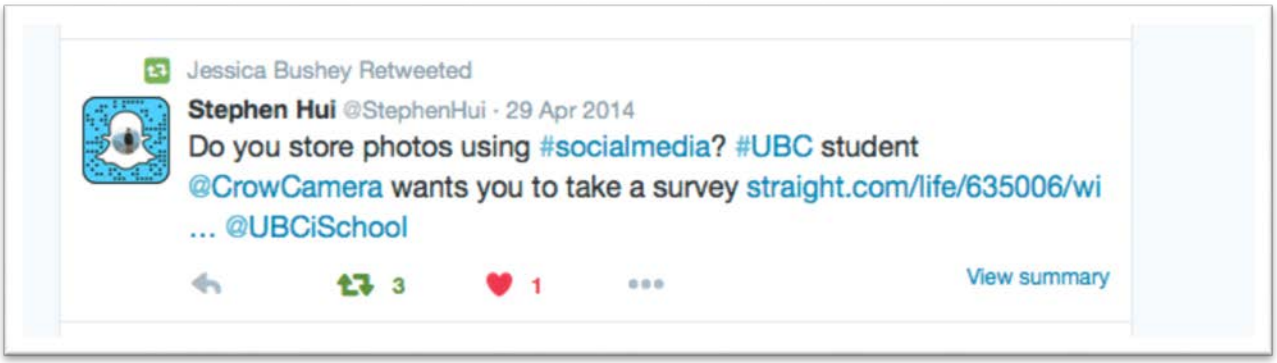


Figure 4 – ReTweet of Invitation to Survey on Hui Twitter Account

Facebook https://www.facebook.com

Facebook is a social networking service that enables members to post photographs and videos, share links and exchange information.

Flickr https://www.flickr.com

Flickr is a photo-sharing service that enables members to upload, access, organize, edit and share digital photographs from any mobile devices and personal computers.

LinkedIn https://www.linkedin.com

LinkedIn is a business-oriented social networking service that enables members to post photographs, share links and exchange information.

Reddit https://www.reddit.com

Reddit is an entertainment, news website and social networking service that registered community members can submit content and share hyperlinks.

Amazon Mechanical Turk https://www.mturk.com

Amazon Mechanical Turk is an online crowdsourcing service. The service enables individuals (i.e., requesters) to post tasks (i.e., Human Intelligence Tasks – HIT) that other individuals (i.e., workers) can complete for payment (i.e., reward).

An invitation to participate in the survey was shared on the following listservs:

Prodig prodig@list.pacificstream.net

This is a discussion list for professional photographers and image creators.

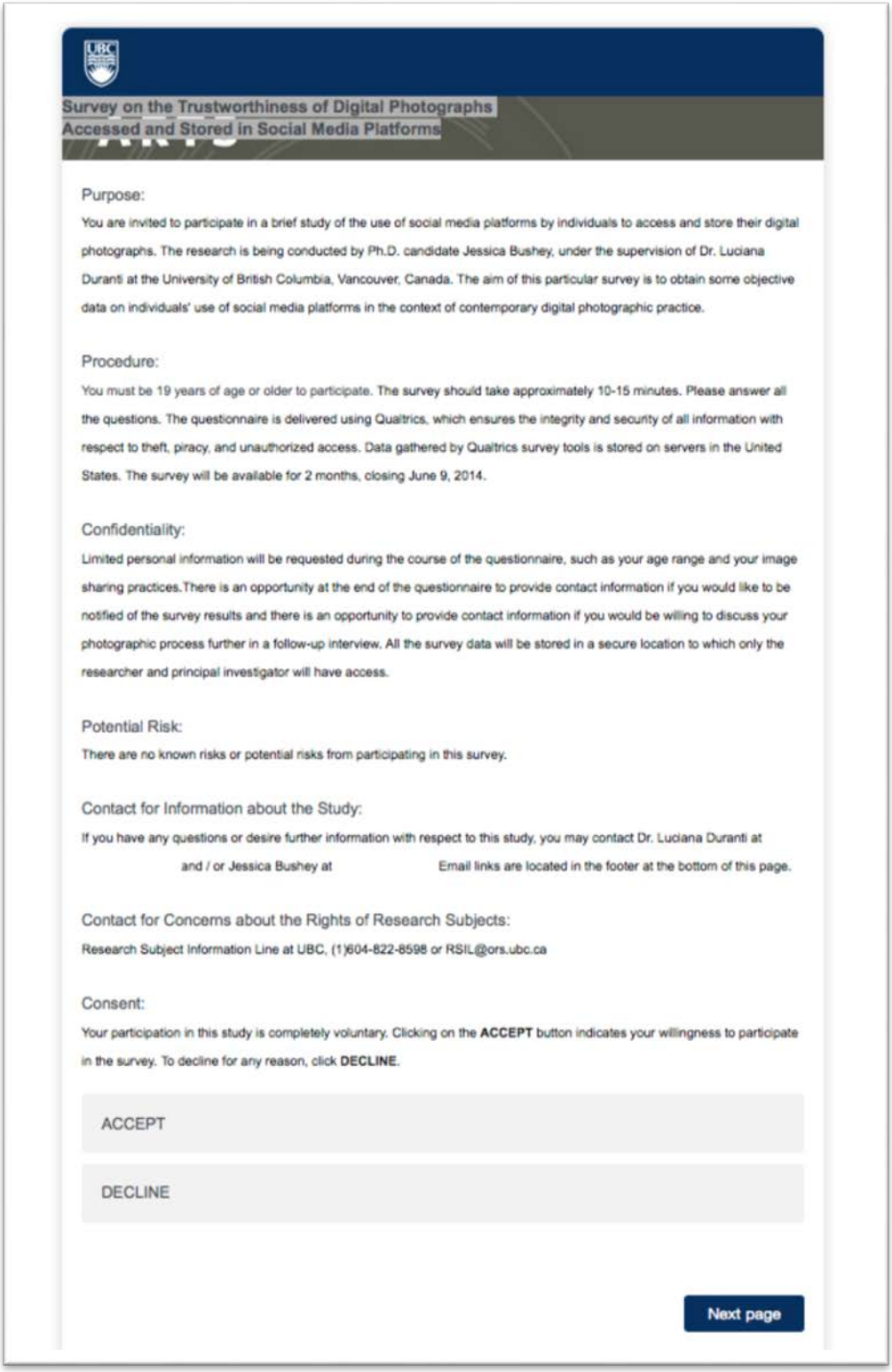
Controlled Vocabulary controlledvocabulary@yahoogroups.com

This is a discussion list for people who are interested in the use of controlled vocabularies, hierarchies, thesauri, and classification schemes used in image databases. (1386 subscribers)

An invitation to participate in the survey was shared on in articles through the following websites:

Ralph Windsor, "Digital Photographs and Trustworthiness of Social Media Platforms," **Digital Asset Management News**, Reviews, Trends and Opinions, April 18, 2014. Available at: http://digitalassetmanagementnews.org/social-media-and-dam/digital-photographs-and-trustworthiness-of-social-media-platforms/.

Stephen Hui, "Will Your Facebook Photos Stand the Test of Time?" **Georgia Straight Life (blog)**, April 29, 2014. Available at: http://www.straight.com/life/635006/will-your-facebook-photos-stand-test-time.



Survey on the Trustworthiness of Digital Photographs Accessed and Stored in Social Media Platforms

Purpose:

You are invited to participate in a brief study of the use of social media platforms by individuals to access and store their digital photographs. The research is being conducted by Ph.D. candidate Jessica Bushey, under the supervision of Dr. Luciana Duranti at the University of British Columbia, Vancouver, Canada. The aim of this particular survey is to obtain some objective data on individuals' use of social media platforms in the context of contemporary digital photographic practice.

Procedure:

You must be 19 years of age or older to participate. The survey should take approximately 10-15 minutes. Please answer all the questions. The questionnaire is delivered using Qualtrics, which ensures the integrity and security of all information with respect to theft, piracy, and unauthorized access. Data gathered by Qualtrics survey tools is stored on servers in the United States. The survey will be available for 2 months, closing June 9, 2014.

Confidentiality:

Limited personal information will be requested during the course of the questionnaire, such as your age range and your image sharing practices.There is an opportunity at the end of the questionnaire to provide contact information if you would like to be notified of the survey results and there is an opportunity to provide contact information if you would be willing to discuss your photographic process further in a follow-up interview. All the survey data will be stored in a secure location to which only the researcher and principal investigator will have access.

Potential Risk:

There are no known risks or potential risks from participating in this survey.

Contact for Information about the Study:

If you have any questions or desire further information with respect to this study, you may contact Dr. Luciana Duranti at and / or Jessica Bushey at Email links are located in the footer at the bottom of this page.

Contact for Concerns about the Rights of Research Subjects:

Research Subject Information Line at UBC, (1)604-822-8598 or RSIL@ors.ubc.ca

Consent:

Your participation in this study is completely voluntary. Clicking on the **ACCEPT** button indicates your willingness to participate in the survey. To decline for any reason, click **DECLINE**.

ACCEPT

DECLINE

Next page

Figure 5 – Web-based Survey Landing Page

Appendix C : Survey Questionnaire

Purpose: You are invited to participate in a brief study of the use of social media platforms by individuals to access and store their digital photographs. The research is being conducted by Ph.D. candidate Jessica Bushey, under the supervision of Dr. Luciana Duranti at the University of British Columbia, Vancouver, Canada. The aim of this particular survey is to obtain some objective data on individuals' use of social media platforms in the context of contemporary digital photographic practice.

Procedure: You must be 19 years of age or older to participate. The survey should take approximately 10-15 minutes. Please answer all the questions. The questionnaire is delivered using Qualtrics, which ensures the integrity and security of all information with respect to theft, piracy, and unauthorized access. Data gathered by Qualtrics survey tools is stored on servers in the United States. The survey will be available for 2 months, closing June 9, 2014.

Confidentiality: Limited personal information will be requested during the course of the questionnaire, such as your age range and your image sharing practices. There is an opportunity at the end of the questionnaire to provide contact information if you would like to be notified of the survey results and there is an opportunity to provide contact information if you would be willing to discuss your photographic process further in a follow-up interview. All the survey data will be stored in a secure location to which only the researcher and principal investigator will have access.

Potential Risk: There are no known risks or potential risks from participating in this survey.

Contact for Information about the Study: If you have any questions or desire further information with respect to this study, you may contact Dr. Luciana Duranti at [redacted] and / or Jessica Bushey at [redacted]. Email links are located in the footer at the bottom of this page.

Contact for Concerns about the Rights of Research Subjects: Research Subject Information Line at UBC, (1)604-822-8598 or RSIL@ors.ubc.ca

Consent: Your participation in this study is completely voluntary. Clicking on the ACCEPT button indicates your willingness to participate in the survey. To decline for any reason, click DECLINE.

- ❍ ACCEPT
- ❍ DECLINE

If ACCEPT Is Selected, Then Skip To What is your age? Please select one

If DECLINE Is Selected, Then Skip To End of Survey

SURVEY STARTS

Q1 What is your age? Please select one of the age ranges below:
- ❍ 19 - 29
- ❍ 30 - 39
- ❍ 40 - 49
- ❍ 50 - 59
- ❍ 60 - 69
- ❍ 70 and over

Q2 Which of the following photo-sharing and social networking services do you use? (Check all that apply):
- ❑ Flickr
- ❑ Instagram
- ❑ Facebook
- ❑ Twitter
- ❑ Dropbox
- ❑ Snapchat
- ❑ Google+
- ❑ iCloud Photo stream
- ❑ Other (Please explain) _____

Q3 Which of the following types of memberships / accounts do you have?
- ❍ Free
- ❍ Paid
- ❍ Both (e.g., Free account with Twitter and a Paid account with Dropbox)

If Free Is Selected, Then Skip To Would you be willing to pay for photo...

If Paid Is Selected, Then Skip To How many years have you been a member...

If Both (e.g., Free account wi... Is Selected, Then Skip To How many years...

Q4 If free memberships / accounts became unavailable, would you be willing to pay for photo-sharing and social networking services?
- ❍ Yes
- ❍ Maybe
- ❍ No

Q5 How many years have you been a member of a photo-sharing and / or social networking site?
- ❍ 1 year or less
- ❍ 2 - 5 years
- ❍ 6-10 years
- ❍ 11 - 15 years
- ❍ Other (Please explain) _____

Q6 In your photographic practice, how often do you use the following devices for capturing digital photographs? Please rate the devices according to frequency of use:

	Never	Occasionally	Very Often	Always
Digital Camera	❍	❍	❍	❍
Smart phone/ Mobile phone	❍	❍	❍	❍
Tablet/ iPad	❍	❍	❍	❍
PC/Mac/Laptop	❍	❍	❍	❍

Q7 Your digital photographic practice is best described as:
- ❍ Professional
- ❍ Amateur
- ❍ Both
- ❍ Other (Please explain) _____

Q8 In general, you use photo-sharing and / or social networking services for:
- ❍ Business
- ❍ Personal
- ❍ Both
- ❍ Other (Please explain) _____

Q9 What is your primary activity when using photo-sharing and social networking services as part of your photographic practice?

- ❍ Access (e.g., finding other people's photographs)
- ❍ Manage/ Use (e.g., finding, organizing and using my photographs)
- ❍ Share (e.g., sharing my photographs with others)
- ❍ Store (e.g., storing my photographs)
- ❍ Other (Please explain) _____

Q10 When using photo-sharing and social networking platforms, how important are the following features of the service? Please rate the features according to importance:

	Not at all Important	Somewhat Important	Neutral	Important	Very Important
Access Images	❍	❍	❍	❍	❍
Manage/ Organize Images	❍	❍	❍	❍	❍
Share Images	❍	❍	❍	❍	❍
Store/ Save Images	❍	❍	❍	❍	❍

Q11 Do you control who can access and use your digital photographs that are stored on photo-sharing and social networking platforms?

- ❍ Yes
- ❍ No

If No Is Selected, Then Skip To Before uploading your digital photogr...

If Yes Is Selected, Then Skip To When controlling access to your digit...

Q12 When controlling access to your digital photographs, how important are the following? Please rate the reasons according to importance:

	Not at all Important	Somewhat Important	Neutral	Important	Very Important
Personal Privacy (e.g., you are in the image)	❍	❍	❍	❍	❍
Privacy of Others (e.g., other people are in the image)	❍	❍	❍	❍	❍
Copyright (e.g., you want to protect your images)	❍	❍	❍	❍	❍
Licensing (e.g., you don't want the social media service to license your image)	❍	❍	❍	❍	❍
Business (e.g., the account is for business clients or employees only)	❍	❍	❍	❍	❍

Q13 Before uploading your digital photographs to photo-sharing and / or social networking sites, do you add information (i.e., metadata) about the creation of your photographs (e.g., who took the photograph, where, when, why) to your digital image file?

❍ Yes
❍ No
❍ Other (Please explain) _____

If Other (Please explain) Is Selected, Then Skip To When adding information to identify y...

If Yes Is Selected, Then Skip To When adding information to identify y...

If No Is Selected, Then Skip To After uploading your digital photogra...

Q14 When adding information to identify your digital photographs, how important are the following types? Please rate the types of information according to importance:

	Not at all Important	Somewhat Important	Neutral	Important	Very Important
Name of photographer	❍	❍	❍	❍	❍
Title of photograph	❍	❍	❍	❍	❍
Place where photograph was taken	❍	❍	❍	❍	❍
Date of photograph	❍	❍	❍	❍	❍
Subject of photograph	❍	❍	❍	❍	❍

Q15 After uploading your digital photographs into photo-sharing and social networking sites, do you add tags, comments, likes or ratings?

❍ Yes
❍ No
❍ Other (Please explain) _____

Q16 Do you use watermarks, copyright symbols, or creative commons licenses to control how people may use your digital photographs that are accessible on photo-sharing and social networking platforms?

❍ Yes
❍ No
❍ Other (Please explain) _____

Q17 Have you ever downloaded your stored digital photographs from a photo-sharing or social networking site?

❍ Yes
❍ No

If No Is Selected, Then Skip To When you upload a digital photograph …

If Yes Is Selected, Then Skip To Did you experience any problems when ...

Q18 Did you experience any issues when you downloaded your digital photographs out of the photo-sharing or social networking site?

❍ Yes
❍ No

If No Is Selected, Then Skip To When you upload a digital photograph ...

If Yes Is Selected, Then Skip To Please select from the list below…

Q19 Please select any similar issues from the list below (check all that apply):

- ❑ Unexpected size change
- ❑ Unexpected color change
- ❑ Missing files (e.g., not all the digital photographs you selected were downloaded)
- ❑ Missing identity metadata (e.g., photographer name, title, date, GPS location)
- ❑ Missing copyright information
- ❑ Missing comments, tags, likes and ratings
- ❑ Corrupt files (e.g., file will not open after download)
- ❑ Bandwidth and time required (e.g., downloading large numbers of images)
- ❑ Other (Please explain) _____

Q20 When you upload a digital photograph to photo-sharing and social networking sites, do you keep a copy of the digital photograph somewhere else?

- ❍ Yes
- ❍ No
- ❍ Other (Please explain) _____

If Yes Is Selected, Then Skip To How often do you use the following de...

If Other (Please explain) Is Selected, Then Skip To How often do you use the..

If No Is Selected, Then Skip To Is the digital photograph in the phot...

Q21 If you do not keep a copy of the digital photograph somewhere else, is it accurate to say that the digital photograph in the photo-sharing and / or social networking site is the only version that you keep?

- ❍ Yes
- ❍ No (Please explain) _____

If Yes Is Selected, Then Skip To In general, how many digital photogra...

If No (Please explain) Is Selected, Then Skip To In general, how many digital photogra...

Q22 When you keep a copy of your digital photographs, how often do you use the following devices for storage? Please rate the devices according to frequency:

	Never	Occasionally	Very Often	Always
Smart phone / Mobile phone	❍	❍	❍	❍
PC/ Mac/ Laptop	❍	❍	❍	❍
External hard drive	❍	❍	❍	❍
Cloud storage (e.g., iCloud)	❍	❍	❍	❍
DVD	❍	❍	❍	❍

Q23 In total, how many digital photographs do you have stored in your photo-sharing and social networking accounts?

❍ 1 - 100
❍ 101 - 500
❍ 501 - 1,000
❍ 1,001 - 5,000
❍ 5,001 - 10,000
❍ 10,000 - 50,000
❍ 50,001 - 100,000
❍ 101, 000 and over

Q24 Before signing-up for the photo-sharing and social networking account, did you read the "Terms"? (e.g., Terms of Use)

❍ Yes
❍ Sort of (e.g., skim quickly or brief review)
❍ No

If Sort of (e.g., skimmed quic... Is Selected, Then Skip To In the "Terms" do you remember readin...

If Yes Is Selected, Then Skip To In the "Terms" do you remember readin...

If No Is Selected, Then Skip To Have you ever had your account delete...

Q25 In the "Terms" do you remember reading any of the following sections? (check all that apply)

- ❑ Terms of Service (e.g., rules that you must agree to, in order to use the service)
- ❑ Privacy Policy (e.g., explanation of how the service gathers, uses, discloses and manages customer data)
- ❑ Copyright and Intellectual Property (e.g., explanation of who owns the content posted to the service)
- ❑ Rights of Others (e.g., rules against posting content that violates or infringes on the rights of others)
- ❑ Advertisers (e.g., explanation of how the service uses customer content for advertising activities)
- ❑ None of the above

Q26 Have you ever had your account deleted by the service provider due to inactivity or by accident?

- ❍ Yes (
- ❍ No

If Yes Is Selected, Then Skip To Were you able to contact the service ...

If No Is Selected, Then Skip To How long do you expect to have access...

Q27 When your account was deleted, were you able to contact the service provider and restore your account and all your digital photographs?

- ❍ Yes
- ❍ No

If Yes Is Selected, Then Skip To How long do you expect to have access...

If No Is Selected, Then Skip To Did you have copies of your digital p...

Q28 Did you have copies of your digital photographs stored in another account or on a different device?

- ❍ Yes
- ❍ No

Q29 How long do you expect to have access to your digital photographs that are stored in photo-sharing and social networking sites?

- ❍ Less than 1 year
- ❍ 1 - 3 years
- ❍ 4 - 6 years
- ❍ 7 - 10 years
- ❍ 10 - 20 years
- ❍ More than 20 years
- ❍ I don't know

Q30 In the case of death, have you recorded a list of your photo-sharing and social networking accounts, including passwords, and designated someone as a beneficiary?

- ❍ Yes
- ❍ No
- ❍ Other (Please explain) _____

Q31 If you would like to receive the summarized results of this survey, please provide a contact email address in the box below. If not, leave blank. Your email address will only be used for this purpose.

Email (1)

Q32 If you are willing to participate in a brief interview to discuss the workflow of your digital photographic practice and express your perceptions of photo-sharing and social networking services as potential repositories for access and preservation of digital photographs in the future, please provide your email address in the box below. If not, leave blank. All responses to the survey and interviews will be anonymized to protect participant privacy.

Email (1)

Q33 TO COMPLETE YOUR SURVEY, PLEASE SELECT THE SUBMIT BUTTON BELOW.

- ❍ SUBMIT (1)

If SUBMIT Is Selected, Then Skip To End of Survey

If SUBMIT Is Selected, Then Skip To End of Survey

Appendix D : Survey Charts

Q1. What is your age? Please select one of the age ranges below:

Age Range		Count	%
19 - 29		185	37.4%
30 - 39		154	31.2%
40 - 49		89	18.0%
50 - 59		46	9.3%
60 - 69		17	3.4%
70 and over		3	0.6%
Total		494	100.0%

Figure 6 – Age Range of Participants.

Q2. Which of the following photo-sharing and social networking services do you use? (Check all that apply):

Social Media Service		Count	%
Flickr		166	33.6%
Instagram		182	36.8%
Facebook		449	90.9%
Twitter		229	46.4%
Dropbox		194	39.3%
Snapchat		45	9.1%
Google+		160	32.4%
iCloud Photo stream		73	14.8%
Other (Please explain)		53	10.7%

Figure 7 – Social Media Services.

Q.3. Which of the following types of memberships/accounts do you have?

Accounts		Count	%
Free		406	82.2%
Both		79	16.0%
Paid		9	1.8%
Total		494	100.0%

Figure 8 – Types of Accounts.

Q.4. If free memberships/accounts became unavailable, would you be willing to pay for photo-sharing and social networking services?

Response		Count	%
Yes		56	13.8%
Maybe		208	51.2%
No		142	35.0%
Total		406	100.0%

Figure 9 – Willingness to Pay For Accounts.

Q.5. How many years have you been a member of a photo-sharing and/or social networking site?

Response		Count	%
1 year or less		14	2.8%
2 - 5 years		223	45.1%
6-10 years		232	47.0%
11 - 15 years		25	5.1%
Other (Please explain)		0	0.0%
Total		494	100.0%

Figure 10 - Years of Membership.

Q.6. In your photographic practice, how often do you use the following devices for capturing digital photographs? Please rate the devices according to the frequency of use:

Device	Never	Occasionally	Very Often	Always	Total Count	Mean
Digital Camera	30	183	160	121	494	2.8
Smart phone/ Mobile phone	27	91	229	146	493	3.0
Tablet/ iPad	294	128	51	16	489	1.6
PC/Mac/Laptop	304	113	46	26	489	1.6

Figure 11 – Devices for Capture.

Q.7. Your digital photographic practice is best described as:

Response		Count	%
Professional		64	13.0%
Amateur		328	66.4%
Both		93	18.8%
Other (Please explain)		9	1.8%
Total		494	100.0%

Figure 12 – Photographic Practice.

Q.8. In general, you use photo-sharing and/or social networking services for:

Response		Count	%
Business		16	3.2%
Personal		298	60.3%
Both		179	36.2%
Other (Please explain)		1	0.2%
Total		494	100.0%

Figure 13 – Purpose of Service.

Q.9. What is your primary activity when using photo-sharing and social networking services as part of your photographic practice?

Response		Count	%
Access		53	10.7%
Manage/ Use		46	9.3%
Share		351	71.1%
Store		41	8.3%
Other (Please explain)		3	0.6%
Total		494	100.0%

Figure 14 – Primary Activity on Social Media Platform.

Q.10. When using photo-sharing and social networking platforms, how important are the following features of the service? Please rate the features according to importance:

Question	Not at all Important	Somewhat Important	Neutral	Important	Very Important	Total Count	Mean
Access Images	9	40	47	226	172	494	4.0
Manage/ Organize Images	32	48	96	188	130	494	3.7
Share Images	7	17	31	195	244	494	4.3
Store/ Save Images	45	51	65	191	142	494	3.7

Figure 15 – Distribution of Important Social Media Features.

Q.11. Do you control who can access and use your digital photographs that are stored on photo-sharing and social networking platforms?

Response		Count	%
Yes		419	84.8%
No		75	15.2%
Total		494	100.0%

Figure 16 - Control of Access and Use.

Q.12. When controlling access to your digital photographs, how important are the following? Please rate the reasons according to importance:

Question	Not at all Important	Somewhat Important	Neutral	Important	Very Important	Total Responses	Mean
Personal Privacy	11	32	38	156	182	419	4.1
Privacy of Others	8	28	54	186	143	419	4.0
Copyright	47	54	79	128	111	419	3.5
Licensing	38	45	72	122	142	419	3.7
Business	130	41	104	91	53	419	2.8

Figure 17 – Distribution of Reasons for Controlling Access and Use.

Q.13. Before uploading your digital photographs to photo-sharing and/or social networking sites, do you add information (i.e., metadata) about the creation of your photographs (e.g., who took the photograph, where, when, why) to your digital image files?

Answer		Response	%
Yes		221	44.7%
No		235	47.6%
Other (Please explain)		38	7.7%
Total		494	100.0%

Figure 18 – Adding Metadata to Images Prior to Upload.

Q.14. When adding information to identify your digital photographs, how important are the following types? Please rate the type of information according to importance:

Info Types	Not at all Important	Somewhat Important	Neutral	Important	Very Important	Total Responses	Mean
Name of photographer	41	33	27	74	84	259	3.5
Title of photograph	42	27	66	84	40	259	3.2
Place where photograph was taken	19	26	56	109	49	259	3.6
Date of photograph	19	34	60	98	48	259	3.5
Subject of photograph	21	35	48	104	51	259	3.5

Figure 19 – Distribution of Information Added to Images Before Upload.

Q.15. After uploading your digital photographs into photo-sharing and social networking sites, do you add tags, comments, likes, or ratings?

Response		Count	%
Yes		373	75.5%
No		89	18.0%
Other (Please explain)		32	6.5%
Total		494	100.0%

Figure 20 – Adding Tags, comments, Likes, and Ratings After Upload.

Q.16. Do you use watermarks, copyright symbols, or creative commons licenses to control how people may use your digital photographs that are accessible on photo-sharing and social networking sites?

Response		Count	%
Yes		123	24.9%
No		353	71.5%
Other (Please explain)		18	3.6%
Total		494	100.0%

Figure 21 - Watermarks, Copyright and Creative Commons to Control Access & Use.

Q.17. Have you ever downloaded your stored digital photographs from a photo-sharing or social networking site?

Response		Count	%
Yes		346	70.0%
No		148	30.0%
Total		494	100.0%

Figure 22 – Downloading Images from Social Media Platforms.

Q.18. Did you experience any issues when you downloaded your digital photographs out of the photo-sharing or social networking site?

Response		Count	%
Yes		71	20.5%
No		275	79.5%
Total		346	100.0%

Figure 23 – Issue With Downloaded Images.

Q.19. Please select any similar issues from the list below (check all that apply):

Issues		Count	%
Unexpected size change		42	59.2%
Unexpected color change		30	42.3%
Missing files		20	28.2%
Missing identity metadata		28	39.4%
Missing copyright information		24	33.8%
Missing comments, tags, likes and ratings		23	32.4%
Corrupt files		25	35.2%
Bandwidth and time required		20	28.2%
Other (Please explain)		8	11.3%

Figure 24 – Issues Experience with Downloading Images from Social Media Platforms.

Q.20. When you upload a digital photograph to photo-sharing and social networking sites, do you keep a copy of the digital photograph somewhere else?

Response		Count	%
Yes		456	92.3%
No		24	4.9%
Other (Please explain)		14	2.8%
Total		494	100.0%

Figure 25 – Keeping Copies of Digital Photographs

Q.21. If you do not keep a copy of the digital photograph somewhere else, is it accurate to say that the digital photograph in the photo-sharing and/or social networking site is the only version that you keep?

Response		Count	%
Yes		22	91.7%
No (Please explain)		2	8.3%
Total		24	100.0%

Figure 26 – Copy on Social Media Platform is the Only Version Kept.

Q.22. When you keep a copy of your digital photographs, how often do you use the following devices for storage? Please rate the devices according to frequency:

Devices	Never	Occasionally	Very Often	Always	Total Count	Mean
Mobile/smartphone	82	140	175	72	469	2.5
PC/ Mac/ Laptop	13	43	182	231	469	3.3
External hard drive	74	96	106	193	469	2.9
Cloud storage (e.g., iCloud)	182	133	92	61	468	2.1
DVD	276	121	40	31	468	1.6

Figure 27 – Distribution of Use of Devices for Storing Copies of Images

Q.23. In total, how many digital photographs do you have stored in your photo-sharing and social networking accounts?

Total Images		Count	%
1 - 100		63	12.8%
101 - 500		128	25.9%
501 - 1,000		111	22.5%
1,001 - 5,000		120	24.3%
5,001 - 10,000		39	7.9%
10,000 - 50,000		21	4.3%
50,001 - 100,000		8	1.6%
101, 000 and over		4	0.8%
Total		494	100.0%

Figure 28 – Total Number of Images Held in Social Media Accounts.

Q.24. Before signing-up for the photo-sharing and social networking account, did you read the "Terms"? (e.g., Terms of Use)

Response		Count	%
Yes		98	19.8%
Sort of (e.g., skim quickly or brief review)		294	59.5%
No		102	20.6%
Total		494	100.0%

Figure 29 - Reading the "Terms" Prior to Joining Social Media Services.

Q.25. In the "Terms" do you remember reading any of the following sections? (Check all that apply)

Sections of "Terms"		Count	%
Terms of Service		289	73.9%
Privacy Policy		299	76.5%
Copyright and Intellectual Property		207	52.9%
Rights of Others		126	32.2%
Advertisers		111	28.4%
None of the above		32	8.2%

Figure 30 – Distribution of Sections Read and/or Skimmed in "Terms".

Q.26. Have you ever had your account deleted by the service provider due to inactivity or by accident?

Response		Count	%
Yes		32	6.5%
No		462	93.5%
Total		494	100.0%

Figure 31 – Account Deleted by Service Provider

Q.27. When your account was deleted were you able to contact the service provider and restore your account and all your digital photographs?

Response		Count	%
Yes		21	65.6%
No		11	34.4%
Total		32	100.0%

Figure 32 – Restoration of Account After Deletion.

Q.28. Did you have copies of your digital photographs stored in another account or on a different device?

Response		Count	%
Yes		7	63.6%
No		4	36.4%
Total		11	100.0%

Figure 33 – Copies Stored in Another Account or Device.

Q.29. How long do you expect to have access to your digital photographs that are stored in photo-sharing and social networking sites?

Response		Count	%
Less than 1 year		26	5.3%
1 - 3 years		72	14.6%
4 - 6 years		69	14.0%
7 - 10 years		41	8.3%
10 - 20 years		44	8.9%
More than 20 years		84	17.0%
I don't know		158	32.0%
Total		494	100.0%

Figure 34 – Expected Durations of Access to Social Media Accounts.

Q.30. In the case of death, have you recorded a list of your photo-sharing and social networking accounts, including passwords, and designated someone as a beneficiary?

Response		Count	%
Yes		82	16.6%
No		402	81.4%
Other (Please explain)		10	2.0%
Total		494	100.0%

Figure 35 - Prepared List of Accounts and Passwords in the Event of Death.

Appendix E : Invitation to Survey

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

February 3, 2015

Dear Survey Participant,

In Spring 2014 you completed my survey on the **trustworthiness of digital photographs accessed and stored in photo-sharing and social networking platforms** and indicated that you would be willing to participate in a follow-up interview. As you may recall, I am a PhD candidate in the School of Library, Archival and Information Studies at the University of British Columbia (UBC) under the direction of Dr. Luciana Duranti.

As part of my research I am conducting follow-up interviews with selected individuals from the survey who create, share and store digital photographs with social media platforms, such as Facebook, Instagram and Twitter. The interview should take **45 minutes of your time**, and will be arranged at your convenience in the month of February. The interview will be conducted via Skype (audio only), phone or in-person, depending upon your preference and location. The interview will be recorded for research purposes. The interview asks four questions about your experiences with digital photographs and social media platforms, as well as your expectations of future access and long-term preservation of your digital collections. The interview questions will be sent to you ahead of time, but no preparation is required. The aim of the interview is to obtain in-depth descriptions of individual's use of social media platforms in the context of digital photographic practice.

Your participation in the interview is voluntary and you may end the interview at any time. Click on the appropriate boxes below, save the form and return it to me via email. If you are wiling to participate in the interview, I will contact you within the next 48 hours to arrange an interview time and provide you with a consent form.

☐ No, I do not wish to participate.
☐ Yes, I am willing to participate in a follow-up interview.

I prefer to be interviewed using:

☐ Skype (audio only) My Skype handle is: _____

☐ Telephone. You can contact me at: _____

☐ In-Person (dependent upon location)

If you have any additional questions, please do not hesitate to email me.

Sincerely,

Jessica Bushey
PhD Candidate, School of Library, Archival and Information Studies
University of British Columbia
Irving K. Barber Learning Centre
Suite 471 – 1961 East Mall
Vancouver, British Columbia V6T 1Z1 CANADA
[redacted]

Dr. Luciana Duranti (Faculty Supervisor)
Chair and Professor, Archival Studies
University of British Columbia
Irving K. Barber Learning Centre
Suite 470 – 1961 East Mall
Vancouver, British Columbia V6T 1Z1 CANADA
[redacted]

Appendix F : Interview Protocol

1.0 Internal Information

Date: [Month, day, year]
Method of Interview: Skype / Telephone / In-Person
Name: [Last, First]
Corresponding ID of web-survey response: [ ]

2.0 Introductions and Consent

2.1 Introduce myself and explain the overall purpose of the research:

2.2 Good [morning/afternoon], thank you [name] for taking the time out of your busy schedule to participate in the study ***Trustworthiness of Digital Photographs Accessed and Stored in Photo-sharing and Social Networking Platforms***. The first phase of the study involved a web-based survey questionnaire that explored the general circumstances of creating digital photographs and using photo-sharing and social networking platforms to access, share and store your collections. At the end of the survey, you kindly volunteered to participate in the second phase of the study, one-on-one interviews.

The interview asks questions about your experiences with using social media services for accessing, sharing and storing your digital photographs, and your perceptions about continuing access and long-term preservation of your digital photograph collections held within social media platforms. The time allotted for the interview is 45 minutes and there are four questions in total. Before we begin, are there any questions you have for me regarding the study or my professional background?

2.3 Confirm receipt of the signed consent form and ask if they have any questions regarding the consent form. Restate the key points of the consent form: a) their option to end the interview at any time; b) the audio of the interview will be recorded; and c) their responses will be anonymized. Let them know that recording of the interview will commence.

3.0 Interview Questions

Research Primary Question: To what extent do contemporary photographic practices involving mobile/smartphones and social media platforms differ from earlier film-based practices?

1. I'm interested in comparing earlier film-based photographic practices with current digital practices that use social media platforms. If you can recall how you created, shared and stored film-based photographs, please explain the major differences between your film-based practice and your current digital practice.

Research Primary Question: To what extent do contemporary image-making practices impact the reliability and accuracy of digital photographs?

2. The survey reveals that nearly fifty percent of photographers add information about the creation of their photographs (e.g., who, what, where, when, why, how) before sharing them on social media platforms. Would you describe your practice (step-by-step)?

3. Do you believe that adding or removing image metadata to digital photographs before upload is important?

4. Why or Why not?

Research Primary Question: To what extent do current policies and procedures regarding the management and storage of digital photographs by photo-sharing and social networking sites impact the identity and integrity of digital photographs?

5. The survey reveals that seventy-five percent of photographers add comments and tags to their photographs after uploading them to social media platforms. Would you describe your practice (step-by-step)?

6. Do you believe that adding or removing comments and tags to digital photographs after upload is important?

7. Why or Why not?

Research Primary Question: What are individuals' perceptions about the continuing access and long-term preservation of digital photograph collections in social media platforms?

8. In the past, families passed down photo albums to younger generations or donated personal photographic collections to archival repositories. What benefits and/or obstacles do you think social media platforms introduce to the preservation of digital photographs and photographic collections for future generations?

9. How will you pass down your digital photographs to future generations?

4.0 Concluding Question

10. Is there anything you would like to add?

5.0 Procedural Information

5.1 Thank you for participating in the second phase of the study. I appreciate your time and your willingness to share your experiences and perceptions about your digital photographic practice and your use of social media platforms.

5.2 As part of my research process I will be providing you with a transcript of the interview via email. Please feel free to check for accuracy and make any changes or redactions to the document and then email the revised version back to me within one week. If you require more time please let me know. If you would like to receive the transcript in the post or by fax, please tell me at this time.

Appendix G : Interview Consent Form

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

iSchool @ UBC
University of British Columbia
Suite 470, 1961 East Mall
Vancouver, B.C.
Website: http://www.slais.ubc.ca

INTERVIEW: INFORMED CONSENT INFORMATION LETTER

Informed Consent Information Letter

Interview of Individuals using Photo-sharing and Social Networking Platforms to Access, Share and Store Digital Photographs

Faculty Advisor (Principal Investigator): Dr. Luciana Duranti
Chair and Professor, Archival Studies
iSchool @ UBC

Ph.D. Candidate (Researcher): Jessica Bushey
iSchool @ UBC

Purpose:
You are being invited to participate in a brief study of individuals and their use of photo-sharing and social networking platforms to access, share and store digital photographs. Ph.D. candidate, Jessica Bushey is conducting the research under the direction of Dr. Luciana Duranti. My dissertation research explores the trustworthiness of digital photographs accessed, shared and stored in social media platforms. The aim of this particular interview is to obtain in-depth descriptions of individuals' use of social media platforms in the context of digital photographic practice.

Procedure:
Participation in the study will entail an interview expected to last 45-60 minutes, conducted in person, over the telephone or via Skype. The interview questions will cover your experiences in using photo-sharing and social networking services for accessing, sharing and storing your digital photographs, and your perceptions about continuing access and long-term preservation of your digital photograph collections held within social media platforms. The interview questions will be sent to you ahead of the interview; but no preparation is required. The interview will be digitally recorded and transcribed for research purposes. Your participation is voluntary and you may end the interview at any time.

Confidentiality:
Your identity will be kept confidential. No personal information will be requested during the course of the interview. All the interview data will be stored in a secure location to which only the researcher will have access. Both the audio recording and the interview transcript will remain confidential and will be used only to facilitate the research.

Potential Risk:
There are no known risks or potential risks from participating in this study.

Contact for Information about the Study:
If you have any questions or desire further information with respect to this study, you may contact Jessica Bushey by email at or phone at [redacted] (office) or Dr. Luciana Duranti by email at or by phone at [redacted].

Consent:
Your participation in this study is completely voluntary and you may refuse to participate or withdraw from the study at any time. Your signature below indicates that you have received a copy of this consent form for your own records, that you consent to participate in this study, and that you consent to having the interview recorded.

_____

Subject Signature Date

_____

Printed Name of Subject

_____

Subject Email Address