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Metadata Practices for Digital Photographic Collections in Archives, Libraries, and Museums in Norway

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ABSTRACT

This thesis aims to explore the current state of metadata practices for digital photographic collections in archives, libraries, and museums in Norway in terms of the awareness of metadata and metadata types, the availability of guidelines, the chief source of information on cataloging digital photographic items, the metadata scheme used, subject cataloging standards and the opinions of staff on the problems and factors regarding cataloging digital photographic collections.

A descriptive survey is used as the research method. Data was collected by using an online questionnaire. A survey link was distributed to archives, libraries, and museums in Norway which have digital photographic collection projects. A total of 45 returned questionnaires were analyzed into descriptive statistics by using the *Statistical Package for the Social Sciences* (SPSS) program

The findings indicate that most of the responding memory institutions have guidelines for cataloging digital photographic collections available at their workplaces (in print format more often than digital format). In the opinion of respondents, cataloging digital photographic materials is similar to cataloging photographs in other formats. Further, metadata is very important for organizing digital collections in their perspective. The *Standard for Fotokatalogisering* is the most adopted metadata scheme for digital photographic collections and responding memory institutions assign free keywords more often than using standardized subject heading lists. For the most part, the respondents agree that the mandatory elements in the *Standard for Fotokatalogisering* are the most important.

Considering problems facing the digital collection projects of responding institutions, an insufficient budget is the most problematic, with the highest mean response. Inadequate existing data on the materials and a high demand for specialized knowledge and skills also greatly challenge them. As future challenges facing such projects, respondents most frequently point out user needs, policies on digital photographic collection development, and technology. Respondents highlight knowledge, skills and work resources as their potential contributions of institutions to collaborative projects.

DECLARATION

I certify that all material in this dissertation which is not my own work has been identified and that no material is included for which a degree has previously been conferred upon me.

……Wachiraporn Klungthanaboon……(Signature of candidate)

Submitted electronically and unsigned

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CHAPTER 1
INTRODUCTION

This chapter provides background and a statement of the problem for this study. Further, the research objective and questions are presented. Subsequently, the scope of study and the methodology of the research are also described. Finally, an overall outline of thesis is provided.

1.1 Background

Archives, Libraries, and Museums (ALM) are called *memory institutions* or knowledge repositories. These organizations are responsible for collecting and providing access to human knowledge for the general public and preserving it for future generations (Dempsey, 1999; Lupovici, 1999; Manaf, 2007). With the advantages of modern technology, memory institutions increasingly digitize their collections to serve their users' need and facilitate their users' ability to discover information remotely at anytime (Boock & Vondracek, 2006). This not only enables a wide range of potential users to access cultural heritage, but digitization can also help conserve fragile original documents while displaying surrogates in an accessible form (Deegan & Tanner, 2002).

Photographs are one of the most significant cultural heritage information resources acquired and provided by the archive, library, and museum communities. Photographic materials convey invaluable content and ideas about the society, events, people, culture, and daily life from the past to the present (Harrison, 1981; Hughes, 2004, p.264). In addition, photographs are known to be nonpermanent and easily damaged media. Thanks to the advent of new technologies, digitization is a key solution for preserving, providing accessibility, and exchanging photographic collections in this technology-driven society (Triantaphillidou, Jackson, & Attridge, 2002, p.97).

Consequently, photographic materials are one of the most popularly selected material types to be digitized (Dorner, 2002; Ebdon & Gould, 1999; Manaf, 2007). According to a survey of photographic materials in Europe by the European Commission on Preservation and Access, the 140 institutions who responded to the survey had collected 120 million photographs. Also, approximately four-fifths of the respondents had already started

digitization their photographic collections with the purpose of protecting valuable originals (Deegan & Tanner, 2002, p.50).

However, photographs in both analog and digital formats cannot transmit information comprehensively without text or captions (Victor Burgin's *Thinking Photography* cited in Benson, 2009, p.148). Accordingly, the archive, library, and museum communities have been making an effort to make their photographic collections sensible to users and to facilitate access to the collections by using descriptive and subject cataloging approaches.

As metadata, simply defined as *data about data*, is one of the most critical components of digital libraries (Lopatin, 2006), archival processors, library catalogers, and museum registrars apply the concept of *metadata* to arrange their digital information resources (Gilliland, 2008). Several metadata schemes have been developed for organizing digital resources, such as Encoded Archival Description (EAD), the Dublin Core Metadata Element Set (DCMEs), or Standard ProcEdures for CollecTions Recording Used in Museums (SPECTRUM) from the archive, library, and museum communities, respectively.

In addition to metadata as an organizing tool, the archive, library, and museum communities have to keep up with changing user demands in a digital environment. Users need relevant information without the limitation of material type or the location of the object they ask for. Therefore, Lupovici (1999) suggests that potential solutions to this challenge of meeting user demands may be found through collaboration between archives, libraries, and museums.

As a result, successful mutual resource discovery and exchange across the distributed digital collections of memory institutions require a standardized information organization approach which can provide user-needed metadata for searching and can match results with user needs. This standardized metadata approach will increase the possibility of interoperability and information sharing among memory institutions which share the same goal: to provide ultimately useful information resources to public users (Gilliland, 2008).

There are several research projects that have focused on metadata in the digital environment, highlighting various aspects such as metadata management (Chen, Chen, & Lin, 2003; Wisser, 2005; Zeng, Lee, & Hayes, 2009) or metadata quality (Park, 2009). Some researchers include "metadata" as one topic in their studies on digitization (Boock &

Vondracek, 2006; Dunsire, 2008; Liu, 2004; Lopatin, 2006; Purday, 2009). Further, studies on particular metadata schemes or metadata types have been conducted (Guinchard, 2002; Sukantarat, 2008; Woodyard, 2002). In addition, metadata practices in libraries in terms of standards, techniques, and concerns have also been studies (Ma, 2009). However, there is no study on metadata practices for digital photographic materials in three memory institution types, leaving this particular research area under-researched.

1.2 Statement of Problem

Based on the above review of the literature conducted unfortunately within time constraints, there is no research focusing solely on metadata practices for digital photographic collections among archives, libraries, and museums. Hence, the present study is aimed at investigating the metadata practices for digital photographic collections among these memory institutions. As metadata is a critical tool for managing content, it is likely that metadata practices of these institutions will have an impact on their information retrieval, usage, and management. To be specific, the aim of this study will shed light on the current state and problems of metadata practices for digital photographic collections among these institutions, which may influence their collaboration and interoperability in relation to their digital photographic collections in order to serve user needs in digital environment.

Investigating the current state of metadata practices for digital photographic images in Norway will expand our understanding of current metadata practices and may guide relevant organizations such as the Norwegian Archive, Library, and Museum Authority (ABM-utvikling). The findings may help to enhance the collaboration of these three different memory institution types with similar goals in order to provide better digital cultural heritage information resources. Finally, this empirical research can shed some light and fill in some gaps in the research area of metadata practices

1.3 Research Objective and Research Questions

This research attempts to explore the current state of metadata practices for digital photographic collections in archives, libraries, and museums in Norway. Based on this objective, there are two main research questions with sub-questions as follows:

RQ1: *What is the current state of metadata practices for digital photographic collections in archives, libraries, and museums in Norway?*

Sub-question 1.1 What is the current general state of metadata practices for digital photographic collections in archives, libraries, and museums in Norway?

Sub-question 1.2 Which standards for descriptive and subject cataloging do archives, libraries, and museums in Norway use for their digital photographic collections?

Sub-question 1.3 To what extent do the mandatory elements of the Standard for Fotokatalogisering (Standard for Cataloging Photographs) agree with the perspectives of the archive, library, and museum communities in Norway?

RQ2: *What are the problems and factors regarding cataloging digital photographic collections in archives, libraries, and museums in Norway?*

Sub-question 2.1 What are the problems regarding cataloging digital photographic collections in archives, libraries, and museums in Norway?

Sub-question 2.2 What factors can affect cataloging practices for digital photographic collections in the future?

Sub-question 2.3 To what extent can archives, libraries, and museums in Norway contribute to collaborative digital photographic collection projects?

Sub-question 2.4 What do archives, libraries, and museums in Norway need in order to improve their metadata practices for digital photographic collections?

1.4 Delimitations

The study is limited to the current state of metadata practices for digital photographic collections in archives, libraries, and museums in Norway from the perspective of one representative staff member of each institution. Owing to time constraints, the researcher

does not attempt to collect the viewpoints of every cataloging practitioner in each archive, library, and museum in Norway, even though the result would be able to shed light on the extent of metadata practices in every aspect. Further, the study does not cover other types of memory institutions such as historical organizations and businesses and individuals in the private sector who also have digital photographic collections.

1.5 Methodology

This research is based on a descriptive survey using an online questionnaire as a data collection instrument. The questionnaire consisted of both open-ended and closed-ended questions written in English. The survey link was distributed via email to individuals in charge of digital photographic projects in potential archives, libraries, and museums in Norway. Collected data are quantitative and qualitative. Descriptive statistics are employed to describe quantitative data while data from open-ended questions is analyzed by using content analysis.

1.6 Contribution

By exploring metadata practices for digital photographic collections, the study may improve our understanding of the current state of metadata practices of digital photographic collections in Norway. The findings can create a basis for further specific research in this field. Further, the outcomes are expected to shed light on the improvement of metadata practices for digital photographic collections particularly in order to foster collaborative projects between the archive, library, and museum communities.

In addition, by identifying problems and factors which memory institutions in Norway confront, this study suggests some approaches for the Norwegian Archive, Library, and Museum Authority (ABM-utvikling) or other relevant leading organizations to advocate, in the areas of revising, establishing and promoting standards for digital photographs and organizing training sessions.

1.7 Outline of the Thesis

The study consists of five chapters. This chapter has been an introduction that describes the background of the study and the statement of the problem. It also includes brief introductions to the research objectives and research questions, the scope of the study, the

methodology, and the significance of the study as well as an outline of this study. Chapter Two presents a review of the related literature on key concepts considered relevant and necessary for an understanding of the study of metadata practices for digital photographic collections at memory institutions. Chapter Three focuses on the methodology used in this research. The research population and sampling are presented. The procedures for constructing the data collection instrument are also described. Moreover, data collection and analysis as well as the limitations of study are included in this chapter. Chapter Four reveals the findings of the study and this is contextualized with a discussion based on the literature review and theoretical background. Chapter Five provides a summary of the research and conclusions from the findings. The implications of the study and recommendations for future research are also included.

CHAPTER 2
LITERATURE REVIEW

This chapter will review the literatures relevant to this research. First, it will explain what memory institutions are. Photographic collections and the photographic collections in Norway specifically will then be discussed. Next, there is a section on metadata, in terms of its definition, roles, and types, as well as metadata standards for descriptive and subject cataloging, as well as criteria to adopt metadata schemes. Challenges for the creation of metadata are also included.

However, owing to time constraint, it is not intended to be exhaustive survey. The useful sources for literatures on this study are books, online databases and Internet. Books were consulted for insightful concepts and theory. Several online databases were mainly used for gathering relevant articles which present the current states, conceptual and practical information and trends from the authors' viewpoints. More specifically, Emerald Management Xtra, Library, Information Science & Technology Abstracts, JSTOR, Informa, and EBSCCO A-to-Z were used. Google, Google Scholar, and online journals were also worth to access for the relevant sources. Further, the Norwegian Archive, Library, and Museum Authority (ABM-utvikling)'s website and publications were mainly consulted for sources on the scope of study in the context of Norway.

In addition, meeting Per Olav Torgnesskar, staff from ABM-utvikling, and help from Professor Dr. Michael Preminger, the supervisor, assisted the researcher to more understand the topic and to identify major themes. According to the scope of the study, the related concepts can be divided into three key themes: memory institution, photographic collection, and metadata practice. The search strategy comprised of several main terms "metadata practice", "photograph*", and "memory institution". Further, some using-interchangeable terms such as "picture", "image", and "photograph" were also considered as search terms. Further, other related keywords were also formulated along the way in order to obtain more literatures. Moreover, harvesting relevant sources from references in these resources was another way to get more sources. The literatures were not limited by publication year.

2.1 Memory Institution

Memory institution is "a generic term used to describe an institution that has a responsibility to collect, care for, and provide access to the human record - for example, museums, libraries, and archives" (Baca, 2008, p.75). They are responsible for organizing, maintaining, preserving, and transmitting cultural and intellectual information in any formats for the reference of the future generations (Dempsey, 1999; Manaf, 2007). Further, memory institutions contribute directly and indirectly to social development through support for education, commerce, and personal fulfillments (Dempsey, 1999).

In the digital era, information and communication technology has fostered new approaches to manage cultural heritage information for the public. Numerous memory institutions have joined forces and take advantages of cheap and easy-to-use technology to digitize their various types of valuable cultural heritage resources such as manuscripts, books, maps, postcards, photographs and also audiovisual recordings (Boock & Vondracek, 2006). Digitization enhances the offerings of cultural heritage institutions, making information accessible rapidly and comprehensively from anywhere at any time. In addition, digitization helps to preserve fragile materials (Manaf, 2007).

According to Manaf's (2007) study on the current state of digitization initiatives by cultural institutions in Malaysia, preserving cultural heritage information and supporting education and research activities are the most cited purposes of the digitization of cultural heritage information.

With regard to types of digitized resources, the study on digitization in Malaysia found that photographs are the most popular type of materials to be digitized by memory institutions (Manaf, 2007). The results correspond with the findings of an *IFLA/UNESCO survey on digitization and preservation* (Ebdon & Gould, 1999) and *Survey on digitization in New Zealand* (Dorner, 2002).

The explosion of digitization and digital collections has resulted in the improvement of existing information organization approaches and the development of new approaches for structuring information. Archival processors, library catalogers, and museum registrars frequently apply the approach "metadata" to arrange their digital information resources (Gilliland, 2008). The organization of digital information resources challenges archives, libraries, and museums, which are discussed in the next sections, to improve and adapt for new circumstances.

2.1.1 Archives

Archives have an important role in preserving records which document organizational or personal activities in daily lives and work. As a result, archival materials can be in several formats: texts, images, and sound recordings in analog and digital forms. Archival materials are organized and described in groups. The organization of archival material varies from one archive to another (Taylor & Joudrey, 2009).

Provenance and original order are very significant topics for the organization of materials in archives. The concept of provenance is identified with the creator and indicates that the records belong to their creator. Original order stresses the maintenance of the internal structure and the original arrangement of the creator (Benson, 2009).

Due to the emerging concepts of metadata and digital resources, the archive community developed metadata standards in order to organize particular archival information. The Encoded Archival Description (EAD) standard has been employed recently to encode finding aids in order to enhance their search ability and their potential to be displayed on the Web (Taylor & Joudrey, 2009).

2.1.2 Libraries

Not only the steadily increasing number and variety of traditional resources, but also the proliferation of digital resources have encouraged the library sector to develop and establish approaches for resource discovery. However, the library community has long experienced and has been active for many years dealing with a variety of information resources (Dorner, 2000).

Library professionals, and catalogers in particular, are experts in developing standards for information organization and retrieval such as the MARC standard, the Anglo American Cataloging Rules, Library of Congress Subject Headings (LCSH), and the Dewey Decimal and Library of Congress classification systems. The community recognizes the role of standardization in resource sharing and system development among institutions sharing the same goals. However, these standards may not be appropriate to organizing digital information resources. So the library community has tried to keeps up with the changing technology by revising existing standards and also attempting to develop a new cataloging approach, known as “metadata”. Even though the term “metadata” is new, the concept is not new for library professionals. Dorner (2000, p.81) indicates that “metadata is about

standardizing information. Standardizing information is what catalogers have done for centuries". The ultimate goals of providing access, facilitating searching, and sharing information remain the same even there are changes in formats, technology, and user expectations (Hirons & Graham, 1998).

Among metadata approaches, the Dublin Core Metadata Set (DCMS), the Metadata Encoding and Transmission Standard (METS), and the Metadata Object Description Schema (MODS) are some examples of metadata schemes developed and derived from the library's perspective in order to organize digital information (NISO, 2004).

2.1.3 Museums

With the advent of new technologies, museums have shifted from exclusively emphasizing on comprehensive research and preservation to serving widespread audiences (Spinazzè, 2004, p.37-38). Thousands of museums are digitizing their collections in order to allow the public to access their digital collections freely from around the world (Orma & Pettitt, 1998, p.51; Tedd & Large, 2005, p.29). The difficulties arising from the richness of the digitized collections and the advanced technology are mainly associated with the organization of information. Even though museum professionals realize the importance of sharing information, working without shared standards will affect the accessibility of information (Marty, Rayward, & Twidale, 2003, p.266). Standards advocate collaborative relationships and enable institutions to share information about their collections across disciplines and institutional boundaries (Tedd & Large, 2005, p.85-86).

Spinazzè (2004, p.38) points out the advantages of metadata for museums:

- Create a sense of community
- Demonstrate the importance of documentation
- Expose the complex nature of museum activities such as collection, development, curating, education, service, and support activities
- Raise standards for professional practice and encourage higher levels of performance
- Broaden the scope of professionals in the field

- Open doors to a diversity of perspectives and opportunities for educational experiences outside of the traditional exhibition/publication paradigm
- Challenge traditional roles and responsibilities within the museum
- Occupy a different space in society, i.e., become a more important element of everyday life.

Among the museum community, there is an attempt to address the issue of developing metadata standards for the documentation of holdings for data exchange between museums. SPECTRUM is a standard of documentation of museum collections used in the UK. This standard was launched by the Museum Documentation Association, UK, as a result of a collaboration of practitioners in museums. The Consortium for the Computer Interchange of Museum Information (CIMI) is an organization established to encourage the creation of a standard for digital museum information management and delivery**.** CIMI designed a metadata test bed based on SPECTRUM which was publicly available in March 2003. In addition to CIMI, the Visual Resources Association is a multidisciplinary community of image management professionals interested in the promotion of education and cultural heritage. The association launched the VRA Core Categories as a standard to describe works of visual culture and images (Patel et al, 2005, p.179-180).

2.2 Photographic Collections

2.2.1 Definition of *Photograph*

Several terms such as *image*, *photograph*, *picture*, and *visual resources* are interchangeably used for *photograph*. Kissa (2004, p.14) explains, "…It is agreed that slides or prints corrected or modified by a computer are photographs. On the contrary, images made by drawing or painting without using a camera or light are not photographs..." Kissa (2004, p.14) adds there is a debatable gray area about digital compositions containing both photographic and non-photographic material.

According to the book *Cataloging Cultural Objects: A Guide to Describing Cultural Works and Their Images* (Baca, 2006, p.5), the term *image* means a visual representation of a *work*. Actually, it could exist in photomechanical, photographic or digital format. In visual resources collections specifically, an image is a slide, photograph, or digital file.

However, the term *image* does not include three-dimensional physical models, drawings, paintings, or sculptures.

In addition, Jörgensen (2003) explains the definitions of *image*, *picture*, and *photograph* by referring to the definition of *image* from the Random House Unabridged Dictionary: "a physical likeness or representation of a person, animal, or thing, photographed, painted, sculptured, or otherwise made visible" (Flexner, 1993 quoted in Jörgensen, 2003, p.3). Additionally, he indicates that "… "Image" refers to concrete external representations rather than to mental or internal imagery. The term "picture" is also frequently used in the literature, especially in relation to human memory. Therefore, the terms "picture" and "image" will both be used in appropriate contexts…Depending on the specific domain of discussion, images may also be described by their format, such as photograph or painting; these are also considered synonymous with image" (Jörgensen, 2003, p.3).

Briefly, the terms *image*, *picture*, and *photograph* are defined similarly and used interchangeably in accordance with the appropriate context. However, in this research project, the term *photograph* will be employed because this term best represents the particular format of image taken by a camera or a digital camera, but it excludes images made by drawing and painting.

2.2.2 The Importance and Digitization of Photographic Collection

Photographic collections, a major cultural heritage information resource, are collocated and preserved in archives, libraries, and museums. Photographs are artistic media and have been treasured as cultural information carriers and historical documents (Greve, n.d., p.139). Photographic collections include black-and-white and colored photographs on glass plates, negative film, and photographic paper. Further, pictures and illustrations from magazines, exhibition and auction catalogs, postcards, book jackets, publishers' fliers, and any other conceivable source are also included (Jones & Gibson, 1986, p.133). Jones and Gibson (1986) describe that photographs can be categorized as reproductions of works of art under the jurisdiction of the art librarian and as works of art themselves under the curator's jurisdiction.

As cultural heritage information resources, photographic collections convey important information about lives and activities from the past to the present (Hughes, 2004, p.264). However, photographs cannot transmit information comprehensively without any text or

caption. In the following statement from Victor Burgin's *Thinking Photography*, cited by Benson (2009, p.148), the author indicates the relationship of text to photographs:

> We rarely see a photograph in use which is not accompanied by writing: in newspapers the image is in most cases subordinate to the text; in advertising and illustrated magazines there tends to be a more or less equal distribution of text and images; in art and amateur photography the image predominates, though a caption or title is generally added. But the influence of language goes beyond the physical presence of writing as a deliberate addition to the image. Even the uncaptioned photograph, framed and isolated on a gallery wall, is invaded by language when it is looked at.

Consequently, the archive, library, and museum communities have been making an effort to make their photographic collection sensible to their target users and facilitate access to their collections by using descriptive and subject cataloguing approaches.

For decades, photographs have been known as nonpermanent and easily damaged media. Thanks to the advent of technology, digitization is a key solution for preserving and also providing accessibility to photographic collections in this technological-driven society (Triantaphillidou, Jackson, & Attridge, 2002, p.97). The reasons for digitizing photographs are to increase accessibility, to reproduce the originals easily, to preserve the originals, and to support educational and research goals (Hughes, 2004, p.265). Apart from digitizing existing photographs, photographs are currently also "born-digital" through the use of a digital camera. As a result, memory institutions are challenged to acquire and organize photographic collections which are been both digitized and born-digital.

Many memory institutions have embarked on digitizing photographic collection projects. The 700 35mm photographs in the collection of William Henry Fox Talbot, University of Westminster, UK were digitized, for example (Triantaphillidou, Jackson, & Attridge, 2002, p.97). According to research by the European Commission on Preservation and Access, there are 140 institutions collecting 120 million photographs and four-fifths of the respondents had started digitization of their own photographic holdings (Deegan & Tanner, 2002, quoted in Hughes, 2004, p.264). Florida Photographic Archives has started the digitization of their 110,000 photographs and published online http://www.floridamemory.com (Colvin, n.d.).

2.3 Photographic Collections in Norway

The Norwegian Archive, Library, and Museum Authority (ABM-utvikling) was established on January 1, 2003, to work as an intermediary between government and libraries, archives, and museums in Norway under the authority of the Ministry of Culture and Church Affairs (ABM-utvikling, 2010; Hindal & Wyller, 2004, p.207). The organization aims "to contribute to developing, safeguarding and exploiting cultural and knowledge-based capital, and to provide institutions and sectors with improved means to meet the professional and societal challenges of today and tomorrow" (Hindal & Wyller, 2004, p. 208). The ABM-utvikling also intends to develop and revise standards for the documentation, digitization, and preservation of cultural heritage in Norway.

Photographic collections are included in this cultural heritage information. Photographs from ca.1845 until now would be covered (Kulturdepartementet, 2009). According to the report *Out of the dark room* on the preservation and digitization of, and access to, photographic materials (Egeland, 2007), there are more than 60 million photographs in analog format in Norway. About 22 million photographs are held and administered by archives, libraries, and museums. The museum sector holds the largest part while some are also held and managed in archives and libraries (Kulturdepartementet, 2009). Specifically, Gausdal (2006) informs that there are 14.5 million photographs in museums, 5.3 million in archives, and about 1.6 million in libraries. Moreover, 600,000 photographs are distributed in historical organizations, and other places. Therefore, digitization and organization of photographs challenge archives, libraries, and museums.

Based on the survey by the Working Group on Digitization of the Norwegian Archive, Library, and Museum Authority (Gausdal, 2006), scanned photographs also are a large part of the digitized materials. The digitization of photographs is mostly taking place in the museum sector. Some institutions have initiated digitizing projects for photographs in Norway. For example, the Picture Collection of the University of Bergen Library has digitized its Knud Knudsen Archive, one of the two most important photographic collections in Norway, in order to preserve it (Greve, n.d.).

In relation to access to digitized information, both the conversion of resources to digitized format and the establishment of standards for organization and access should be considered (Egeland, 2007). As a result, for photographic collections, the ABM-utvikling has

collected and established standards for cataloging photographic collections, namely the "*Standard for fotokatalogisering*".

The *Standard for fotokatalogisering* (Standard for Cataloging Photographs) is a national standard for cataloging photographic materials. The standard was developed by considering the Dublin Core Metadata Set and the ICOMs (International Council of Museums) CIDOC-CRM (Conceptual Reference Model). Further, SEPIADES (Safeguarding European Photographic Images for Access) was also used as basis for developing this standard (ABM-utvikling, 2008).

In addition to relevant international standards, cataloging database systems were also considered when developing the standard. In Norway, the Primus, ASTA, and Bibliofil cataloging database systems are used within the museum, archive, and library sectors, respectively. Also, PhotoStation is used by many professional institutions dealing with photographic materials. As a result, memory institutions can implement this standard for their photographic collections in these database systems (ABM-utvikling, 2008).

The *Standard for fotokatalogisering* (Standard for Cataloging Photographs) consists of 26 elements which are categorized into four groups. Among the 26 standard fields, there are 14 mandatory elements which have the sign *.

Table 2.1 Core Elements in *Standard for fotokatalogisering* (ABM-utvikling, 2008, p.12-13)

1. Identification and Provenance (Identifikasjon og proveniens)
1. Identifier* (Identifikator) 2. Alternative identifier(Alternativ identifikator) 3. Title* (Tittel) 4. Alternative title (Alternativ tittel) 5. Hierarchy level/detection level* (Hierarkinivå/registreringsnivå) 6. Relationshiip (Relasjoner) 7. Name attached to the origin, ownership and management* (Navn knyttet til opphav, eierskap og forvaltning)
2. Motive and Content Information (Motiv- og innholdsinformasjon)
8. Motive and content description* (Motiv- og innholdsbeskrivelse) 9. Name associated with the subject/content* (Navn knyttet til motiv/innhold) 10. Place name* (Stedsnavn) 11. Motive date* (Motivdato) 12. Motive type (Motivtype) 13. Subject* (Emneord) 14. Classification (Klassifikasjon) 15. Supplementary information (Utfyllende informasjon)

3. Copies and Material Information (Eksemplar- og materialinformasjon) 16. Production date (Produksjonsdato) 17. Material description* (Materialbeskrivelse) 18. Target (Mål) 19. Condition (Tilstand) 20. Rank* (Plassering)
4. Administrative Information (Administrative Informasjon) 21. Policy/copyright* (Klausul/opphavsrett) 22. Accession/growth (Aksesjon/tilvekst) 23. History (Historikk) 24. Other administrative information (Andre administrative opplysninger) 25. Registrar and cataloging date* (Registrator og katalogdato) 26. Imaging* (Bildegjengivelse)

In relation to subject access for photographic collections in Norway, the *Outline of Cultural Materials* and the *UDK (Universell desimalklassifikasjon)* are used as controlled vocabularies for cataloging photographic materials. Local-developed word lists are also employed. In the *Standard for fotokatalogisering,* the list of the most common photographic motive types (subject types) is attached as an appendix for data entered in the field "Motive type (Motivtype)". Further, other international subject heading standards such as TGM II (*Thesaurus for Graphic Materials II)* and the *Fylkesfotonettverk Rogalands* topic list for photographs are also recommended for providing subject access (ABM-utvikling, 2008).

2.4 Definition of Metadata

The term "*metadata*" was coined by Jack E. Myers in the late 1960s and registered in 1986 as a trademark of the computer software company. The context of using this term was changed in the 1990s for the sense of important information to make computer files understandable and useful to humans. Due to the proliferation of the Internet and the Web, *metadata* was initially applied to describe information objects found there (Caplan, 2003, p.1-2). Therefore, this term is used differently in different contexts. Some use it to refer to machine understandable information, while others use it only for records that describe electronic resources (NISO, 2004).

Additionally, the term came with the evolution of digital information and originally referred to standards for describing, classifying, and locating specifically electronic resources and networked information. However, the understanding of this term has been broadened to cover all standardized descriptive information for both digital and non-digital

resources. Consequently, in this sense, *metadata* will include library catalogs and indexing tools as well as archival finding aids for any kind of documents (Chu, 2003, p.37; El-Sherbini & Klim, 2004, p.238).

It is quite difficult to make the definition of *metadata* clear. Also, there is no right or wrong interpretation of *metadata*, it depends on the diffuse environment of use (Caplan, 2003, p.2-3). Consequently, there are several scholars and practitioners defining the term *metadata* in various ways from simple definitions such as "data about data" to the well-defined ones as follows:

According to Dempsey and Heery (1998, p.149), *metadata* is "data associated with objects which relieves their potential users of having to have full advance knowledge of their existence or characteristics. It supports a variety of operations. A user could be either a program or a person."

Caplan (2003, p.3) defines metadata as "structured information about an information resource or any media type or format."

Miller (2004) defines metadata is "…the "extra baggage" associated with a resource that aids a user in finding that resource (find); discover where, and by whom it was created (identify); decide whether the resource is of value to the user (select); and conclude whether there is feasible access to the resource (obtain)." He explains that *metadata* should be aligned with FRBR's (Functional Requirements for Bibliographic Records) user tasks.

Moreover, Association for Library Collections & Technical Services. Committee on Cataloging: Description and Access. Task Force on Metadata (2000, quoted in Gorman, 2004, p.XVI) indicates that "metadata are structured, encoded data that describe characteristics of information-bearing entities to aid in the identification, discovery, assessment, and management of the described entities." This is similar to the definition from the National Information Standards Organization (2004, p.1), "metadata is structured information that describes, explains, locates, or otherwise makes it easier to retrieve, use or manage an information resource."

2.5 The Importance and Functions of Metadata

The evolution and proliferation of digital resources has required new approaches to organize these diverse information resources in new formats to make them accessible. Metadata or structured data has become a new approach which plays a significant role in

the information retrieval and the use, administration, dissemination, and preservation of digital resources in a digital environment (Wisser, 2005, p.164).

Metadata has been an essential component of the digital projects. That is because metadata is crucial for information retrieval especially in search accuracy, assisting evaluation, and the harvesting of digital resources. Particularly for nontextual resources, metadata is essential (Rettig, Liu, Hunter, & Level, 2008). Consequently, comprehensive and detailed metadata can influence the long-term discovery of resources (Hughes, 2004, p.206).

Gilliland (2008, p.6) details the roles of metadata in environments where users can access information without help from intermediaries, as follows:

- Certifies the authenticity and degree of completeness of the content;
- Establishes and documents the context of the content;
- Identifies and exploits the structural relationships that exist within and between information objects;
- Provides a range of intellectual access points for an increasingly diverse range of users; and
- Provides some of the information that an information professional might have provided in a traditional, in-person reference or research setting.

With carefully structured descriptive information, metadata can enhance a remote user's ability to discover resources and search effectively. In addition, metadata provides the context of an information object and maintains the linkage between the object and a digital surrogate. Besides, metadata supports managing digital objects and ensures that they will be accessible in the future by keeping technical data on producing, storing, and maintaining those objects. These data enhance the ability of museums, archives, and libraries to track the lineage of digital objects. Additionally, metadata also allows institutions to track rights, licensing and reproduction information. In term of interoperability, metadata allows diverse institutions to exchange and search for information across systems. Therefore, it expands the usage of collections in the digital age and reaches various users' needs regardless of geographical constraints and diverse institution types (Gilliland, 2008, p.15-17; Lagoze & Payette, 2000, p.99; NISO, 2004, p.1-2).

2.6 Metadata Types

Metadata has usually been categorized into three or five types (Intner, Lazinger, & Weihs, 2006). Most scholars divide metadata into three types: descriptive metadata, structural metadata, and administrative metadata (NISO, 2004; Taylor & Joudrey, 2009; Tennant, 1998)

Tennant (1998, p.30) defines these three basic metadata types in *Digital libraries: 21st century cataloging*, as follows:

> **Descriptive metadata**, which includes the creator of the resource, its title, subject headings, and other elements that will be used to search for and locate the item.
>
> **Structural metadata**, which describes how an item is structured, for example if it is an electronic book composed of scanned pages, each of which is a separate computer image file.
>
> **Administrative metadata**, which includes such things as how the digital file was produced and its ownership

In NISO's booklet "*Understanding Metadata"* (2004, p.1), it was explained that data on rights and preservation are sometimes listed as separate metadata types from the administrative metadata category.

- *Rights management metadata,* which deals with intellectual property rights, and
- *Preservation metadata,* which contains information needed to archive and preserve a resource.

In addition to the above-mentioned first three categories of metadata, Gilliland (2008) divides metadata into five categories based on significant aspects of metadata functionality – administrative, descriptive, preservation, use, and technical metadata. Further, she (2008, p.9) explains each type with clear examples as in the following table.

Table 2.2 Different Types of Metadata and their Functions

Type	Definition	Examples
Administrative	Metadata used in managing and administering collections and information resources	• Acquisition information • Rights and reproduction tracking • Documentation of legal access requirements • Location information • Selection criteria for digitization
Descriptive	Metadata used to identify and describe collections and related information resources	• Cataloging records • Finding aids • Differentiations between versions • Specialized indexes • Curatorial information • Hyperlinked relationships between resources • Annotations by creators and users
Preservation	Metadata related to the preservation management of collections and information resources	• Documentation of physical condition of resources • Documentation of actions taken to preserve physical and digital versions of resources, e.g., data refreshing and migration • Documentation of any changes occurring during digitization or preservation

Technical	Metadata related to how a system functions or metadata behaves	• Hardware and software documentation • Technical digitization information, e.g., formats, compression ratios, scaling routines • Tracking of system response times • Authentication and security data, e.g., encryption keys, passwords
Use	Metadata related to the level and type of use of collections and information resources	• Circulation records • Physical and digital exhibition records • Use and user tracking • Content reuse and multiversioning information • Search logs • Rights metadata

Similar to Gilliland (2008), Hillmann and Marker (2008, p.9) also categorize metadata into five distinct types although they differ in detail:

> • Administrative - - Who created this data? When was this record created? When were the links last checked? Was this record updated and when? Has this record been reviewed and/or approved?
>
> • Descriptive - - most familiar to traditional catalogers; includes basic information such as title, author, genre or format of resource, and how the resource is related to other resources.
>
> • Access/Use - - provides information about access rights and restrictions.
>
> • Preservation - - designed to ensure access to information resources remains over a long period and records details about

format migration and data refreshment. This is typically not done in traditional cataloging as most traditional resources are static and unchanging; the digital world is conversely more dynamic, and metadata must accommodate these changes and updates.

- Structural - - relates the digital files to each other.

In this study, metadata types are categorized into descriptive, structural, and administrative metadata the same as NISO (2004), Taylor & Joudrey (2009), and Tennant (1998). That is because it is the most simple category to understand for the researcher and the willing participants.

2.7 Metadata Scheme

A *metadata scheme* is a set of rules for encoding information to describe the content of information resources and to assist the identification, discovery, and use of information in particular user communities (Baca, 2008; Caplan, 2003, p.5; Smiraglia, 2005, p.4). According to published information resources related to metadata, the term *metadata scheme* and *metadata schema* are used for the same concept. Caplan (2003, p.5) indicates that "the term *scheme* and *schema* are used interchangeably with this general definition. *Schema,* however, has another meaning in relation to computer database technology as the formal organization or structure of a database, and another specialized meaning in relation to XML." For this study, the term *scheme* is used as Caplan has suggested.

2.7.1 Common Metadata Schemes

Every scholarly community has its own needs and jargon. To communicate comprehensively among people and systems, metadata can play an important role to identify the same concept with the same terms (Intner, Lazinger, & Weihs, 2006, p.21). As a result, a variety of metadata schemes were developed by several scholarly communities based on their unique disciplines, user communities and particular purposes (Miller, 2004, p. 21), as follows.

Dublin Core Metadata Set (DCMS)

Dublin Core Metadata Set (DCMS) was developed in 1995 so that everyone (outside just the library community) can describe and organize electronic resources by themselves without requiring cataloging expertise (Intner, Lazinger, & Weihs, 2006, p.33). Therefore, at first, there were fifteen simple elements which can be divided into three groups: 1) the

content of the resource: title, subject, description, source, language, relation, and coverage; 2) intellectual property: creator, publisher, contributor, and rights; and 3) resource-as-an-instance: date, type, format, and identifier.

The weakness of Dublin Core is its simplicity. It causes inconsistencies because it is too simple and general to describe specific materials and to match specific needs (Benson, 2009). However, according to a survey of Dublin Core Metadata Set use in libraries by Guinchard (2002), the reasons libraries chose to use Dublin Core were mostly international acceptance, flexibility, and interoperability.

Encoded Archival Description (EAD)

The development of Encoded Archival Description (EAD) was motivated by the need to provide an enduring standard for machine representation of archival description and facilitate uniform network access to archive and manuscript collections. Furthermore, it is designed to complement traditional MARC cataloging records for detailed description and access. Primarily, EAD is intended to accommodate descriptions of archival holdings in various media (Intner; Lazinger; & Weihs, 2006, p.90).

Categories for the Description of Works of Art (CDWA)

Categories for the Description of Works of Art (CDWA) was formed by the Art Information Task Force (AITF) in the 1990s to encourage art historians, art information professionals, and information providers to use guidelines determined by collaboration for describing works of art, architecture, and visual and textual surrogates (Intner; Lazinger; & Weihs, 2006, p.33; NISO, 2004).

VRA Core Categories

VRA Core Categories was created by the Visual Resources Association Data Standards Committee for describing visual resources, including artworks, artifacts, paintings, sculpture, architecture, and photographs (Schottlaender, 2003, p.23). It was built on the CDWA to enable describing both works of art and images of them (NISO, 2004). For example, VRA Core is used for describing the museum photographs in Cleveland Museum of Art (Benson, 2009).

2.7.2 Specific Metadata Standards for Technical Information

Administrative metadata is important in terms of reproduction and digital preservation. Standards for technical metadata were therefore developed in order to ensure the consistency of describing data. The *ANSI/NISO Z39.87-2006 Data Dictionary - Technical Metadata for Digital Still Images* is a standard set of metadata elements for digital still images. The dictionary was designed for the purpose of facilitating interoperability and supporting long-term management and access to digital image collections (NISO, 2006). Another standard is *DIG35 Specification: Metadata for Digital Images* (www.i3a.org/i_dig35.html). The standard was developed by the DIG35 Initiative Group with the aim "to provide a standardized mechanism which allows end-users to see digital image use as being equally as easy, as convenient and as flexible as the traditional photographic methods while enabling additional benefits that are possible only with a digital format."

2.7.3 Factors Affecting the Choice of a Metadata Scheme

Due to the proliferation of metadata schemes from numerous communities, digitizing projects need to consider and evaluate many points before implementing a system. This is a crucial step influencing the effectiveness of resource discovery and the usability of information resources (Baca, 2003, p.48). In general, the best consideration for choosing a scheme is that scheme most closely fits identified requirements and has the widest acceptance within the community (Ma, 2006, p.8). In addition, a metadata scheme which is appropriate to the holdings and the potential end-users must be selected (Baca, 2003, p.54).

According to the article, "Choosing a Metadata Standard for Resource Discovery" (Kelly, 2006), it is recommended to consider several following issues before implementing a standard: 1) Granularity – which material types do you deal with and which level will you describe? 2) Interoperability – it is recommended to choose the most widely accepted standards among your subject community in order to enable sharing information. 3) Support – choose metadata which are supported by a leading institution. As a result, guidance, software tools, and supports exist. 4) Growth – a standard may or may not be further developed. Are there working groups and workshops? 5) Extensibility – the standard should be extensible and allow combinations with metadata elements from other metadata schemes. 6) Ease of use – a simple standard does not require much expertise or

training to create metadata. 7) Existing experience – previous experience with metadata schemes would probably reduce the implementation time.

However, metadata schemes used by digital projects vary, project by project. The survey on metadata practices in Association of Research Libraries (ARL) libraries conducted by Ma (2009) revealed that the metadata standards used the most by responding ARL libraries were MARC (91%), EAD (84%), and Dublin Core (78%). Also, the Historic Pittsburgh Image Collections project uses a shared metadata scheme based on the Dublin Core Metadata Initiative's element set (Brenner & Mihalega, 2006, p.125).

In addition, some projects design custom-based metadata schemes rather than using national or international metadata standards for their particular metadata needs and requirements. For example, a survey focusing on cataloging system and thesauri in museums, archives, and libraries in the UK revealed that the majority of institutions were cataloguing their collections in accordance with the Museum Documentation Association (MDA) standard and the "SPECTRUM" standard (Birdsey et al., 1999). Among communities using these same standards, consequently there will be knowledge and experience sharing and collaboration when facing barriers (Birdsey, 2000). In Germany, libraries used MAB (machine readable exchange format for libraries) while archives employ Encoded Archival Description (EAD). The *Museumdat* standard has been designed for museums to organize their information resources (Kirchhoff, Schweibenz, & Sieglerschmidt, 2008, p.258-259).

However, it should be realized that there is no "one-size-fits-all" metadata scheme for describing all types of collections and materials that will satisfy every specific professional community, as Baca (2003, p.48) point out. A judicious decision on the appropriate metadata scheme should be made carefully (Baca, 2003, p.54). Alternatively, adopting a certain metadata scheme as a root and mixing it with metadata elements from one or more other metadata schemes may suffice to match a project' s needs.

2.8 Subject Cataloging Standards

Assigning the most appropriate vocabularies for representing the content of information resources as access points can assist users with accessing their needed information (Baca, 2003, p.52; Taylor & Joudrey, 2009). Moreover, subject analysis enables memory institutions to collocate information resources (Taylor & Joudrey, 2009). To determine the aboutness of each item, a controlled vocabulary and natural language are used.

A controlled vocabulary is an organized list of words or subject terms used to index and retrieve information resources by browsing and searching (Baca, 2006, p.28-29; Taylor & Joudrey, 2009, p.334). It is necessary to use a controlled vocabulary to represent the content because natural language is not precise and orderly (Jörgensen, 2003, p.71). Controlled vocabulary can be divided into a controlled list, taxonomy, subject headings, thesaurus, and ontology (Baca, 2006, p.28-29; Taylor & Joudrey, 2009, p.334).

Numerous attempts to standardize access to all information resources result in using controlled vocabulary standards. Among the most-used controlled vocabulary standards are the Library of Congress Subject Headings (LCSH) and the Art & Architecture Thesaurus (AAT), especially in United States (Jörgensen, 1999, p.295). Furthermore, both LCSH and AAT are employed in archive, library, and museum communities (Taylor & Joudrey, 2009).

Library of Congress Subject Headings (LCSH)

The Library of Congress Subject Headings (LCSH) project was started since 1988 and has been kept up-to-date until now. LCSH is a standard intended for all disciplines and all formats (Jörgensen, 2003, p.73). For example, the Florida Photographic Archives (Colvin, n.d.) has applied LCSH to their photographic collections. Furthermore, almost all ARL library respondents use LCSH (96%) (Ma, 2009).

Art & Architecture Thesaurus (AAT)

The Art & Architecture Thesaurus (AAT) was developed in 1979 and first published in 1980. This is a controlled vocabulary with the specific purpose of determining vocabulary and categorizing information on fine art, architecture, decorative art, and material culture (Jörgensen, 1999).

However, in addition to controlled vocabularies, natural language or keywords can also provide subject access to information resources. Currently tagging (or user tagging, social tagging, or social indexing) has been developed to allow users to analyze content and assign keywords to various types of web-based resources, by users for users without unfamiliar technical terms and complicated application rules. Moreover, it can be done by non-experts and users can assign as many tags or keywords as they like (Taylor & Joudrey, 2009, p.364, 366-367).

2.9 Challenges of Metadata Practices

Metadata is an increasingly well-accepted approach to organize digital collections in order to accommodate information organization, information retrieval, long-term preservation and interoperability. Although metadata provides numerous opportunities for libraries, archives, and museums to organize information in the digital environment, it poses challenges to existing cataloging practices (Chen, Chen, & Lin, 2003, p.1; Ma, 2009).

- ***Standards***

The proliferation of emerging metadata schemes and controlled vocabulary standards provides alternatives for digital project implementation. However, it causes difficulties because it requires the implementing community to choose the most appropriate standard for their particular contexts. According to Zeng, Lee, and Hayes's (2009) research on major concerns regarding metadata and controlled vocabularies conducted by distributing a web-based questionnaire to the International Federation of Library Associations and Institutions (IFLA) listserv, the most significant concerns regarding the decisions about element set standards are "to decide which metadata standard to use" and "to learn how to use different metadata schemes together" (62.40 % and 59.40% respectively). For decisions about authority files and controlled vocabularies, the major concern is "to decide whether to use existing controlled vocabularies or authority files (e.g. LCSH, ULAN [The Union List of Artist Names], LC Authorities)" (64.60%).

- ***Time and Cost***

Metadata creation consumes a great deal of time. Additionally, metadata production requires easy-to-use and standardized tools which are expensive (Zeng, Lee, & Hayes, 2009). In addition, creating consistent metadata despite a variety of materials and repositories is costly and difficult (Ma, 2009).

- ***Consistency***

Each institution has its own metadata guidelines. Standards and guidelines vary from project to project. This therefore affects the consistency of metadata creation within a collection and across collaborating repositories (Park, 2009, p.221). Park (2009, p.224) suggests that simple metadata guidelines embedded in Web form or a template provide benefits for the creation of quality metadata.

- ***Interoperability***

The variety of metadata standards used for describing digital objects and providing subject access among communities causes difficulties for information sharing. This requires metadata crosswalk and mappings to accommodate metadata interoperability (Ma, 2009).

- ***Knowledge and skills***

Continuing education and training for metadata professionals enables them to potentially work in new digital circumstances, and it influences the effectiveness of metadata creation (Park, 2009, p.225). Although museum professionals realize the importance of metadata more and more, they feel it requires specialize skills to manage digital information, interpret it for remotely end-users, and preserve it for the next generation (Spinazzè, 2004, p.47).

CHAPTER 3
RESEARCH METHODOLOGY

Chapter 3 is divided into five sections. The first section presents the research objective and research questions. The second section describes who the research population for this thesis is. The third section explains the data collection instrument and methods of data collection as well as the rationale for selecting those methods. The fourth section describes how the collected data is analyzed. The final section discusses the limitations of study.

3.1 Research Objective and Research Questions

This research attempts to investigate the current state of metadata practices for digital photographic collections in archives, libraries, and museums in Norway. To accomplish the objective, the aims of the project can be divided into two main research questions with sub-questions as follows:

RQ1 : *What is the current state of metadata practices for digital photographic collections in archives, libraries, and museums in Norway?*

Sub-question 1.1 What is the general current state of metadata practices for digital photographic collections in archives, libraries, and museums in Norway?

Sub-question 1.2 Which standards for descriptive and subject cataloging do archives, libraries, and museums in Norway use for their digital photographic collections?

Sub-question 1.3 To what extent do the mandatory elements of the Standard for Fotokatalogisering (Standard for Cataloging Photographs) agree with the perspectives of the archive, library, and museum communities in Norway?

RQ 2 : *What are the problems and factors regarding cataloging digital photographic collections in archives, libraries, and museums in Norway?*

Sub-question 2.1 What are the problems regarding cataloging digital photographic collections in archives, libraries, and museums in Norway?

Sub-question 2.2 What factors can affect cataloging practices for digital photographic collections in the future?

Sub-question 2.3 To what extent can archives, libraries, and museums in Norway contribute to collaborative digital photographic collection projects?

Sub-question 2.4 What do archives, libraries, and museums in Norway need in order to improve their metadata practices for digital photographic collections?

To achieve these research questions, descriptive survey was considered as an appropriate approach for this study. Leedy and Ormrod (2010, p.187) describe survey research as involving "acquiring information about one or more groups of people – perhaps about their characteristics, opinions, attitudes, or previous experiences – by asking them questions and tabulating their answers. The ultimate goal is to learn about a large population by surveying a sample of that population; thus, we might call this approach a *descriptive survey* or *normative survey.*"

3.2 Research Population and Sampling

To accomplish the research objective, the researcher made an effort to collect data from the entire willing populations which are archives, libraries, and museums in Norway which have digital photographic collections. The researcher requested that staff in charge of these institutions participate in this research.

However, the total size of the population is difficult to estimate correctly due to a lack of an available census of archives, libraries, and museums in Norway which engage in digital photographic collection projects. Moreover, doing even a preliminary search for the entire population would be prohibitively time-consuming for this five-month research project. Due to these circumstances, it is not feasible to collect the total size of the population and

do random sampling, so convenience sampling, defined as a sample upon selection which appropriate to the convenience of the researcher and is readily available (Denscombe, 2007), was consequently applied for this research.

The researcher attempted to collect as many email contacts of potential archives, libraries, and museums as possible by consulting the *Fotobevaring i Norge* (Photo Preservation in Norway) pamphlet (ABM-utvikling, 2005), the researcher's supervisor Professor Dr. Michael Preminger, and Per Olav Torgnesskar, a staff member of the Norwegian Archive, Library and Museum Authority (ABM-utvikling). The email accounts of 143 potential respondents, comprising of 31 archives, 20 libraries, and 92 museums, were collected in total.

3.3 Data Collection Instrument

The questionnaire was employed as an instrument to gather data from staff in archives, libraries, and museums in Norway which have digital photographic collections. Accordingly, the researcher decided to employ a questionnaire as a data collection tool because it allows the researcher to collect data from a wide range of institution types spread across a wide geographical area relatively inexpensively.

For this study, the questionnaire has both open-ended and closed-ended questions in English. However, open-ended questions allow the respondents to answer in Norwegian in order to gather more detailed responses. This data collecting tool can be divided into three sections (See Appendix 1):

Section 1: The general data on respondents and their collections, such as memory institution type, cataloging database system, work experience, the objectives of the digitization of photographic collections, the disposition of photographic originals, and other digital collections in their institutions.

Section 2: The metadata practices for digital photographic collections. This part includes several closed-ended questions on the awareness of metadata roles, the availability of guidelines, the chief source of information on cataloging digital photographic items, metadata scheme, subject heading standards, metadata types, and the most important elements.

Section 3: The opinions on the problems regarding cataloging digital photographic collections. The collaboration with other memory institutions, the factors affecting cataloging digital photographic collections in the future, support they would like to receive from relevant organizations, as well as other comments and recommendations they might have are also included. This part mostly provides open-ended questions as free space for sharing their opinions and experiences. The data collected from these open-ended questions may add some additional insights to the descriptive data from closed-ended questions (Leedy & Ormrod, 2010, p. 192). Further, the Likert three-point scale of "little," "much," and "a great deal" is used to determine the level of problematic experiences institutions encountered.

Online Questionnaire

People all around the world increasingly use the Internet as a tool for conducting their survey research (Selm & Jankowski, 2006, p. 435). Online surveys provide several advantages to researchers. They can reach a wide range of potential respondents with Internet experience. Due to the anonymity of Internet users, online surveys can facilitate free opinion sharing. Moreover, they are inexpensive compared to paper-and-pencil surveys and they reduce the time necessary to distribute and collect responses, thereby eliminating most geographical constraints (Selm & Jankowski, 2006, p. 436-437).

Considering the advantages of online surveys, the researcher decided to administer the online questionnaire as the data collection instrument for this project. The researcher aimed to gather information on cataloging practices from archives, libraries, and museums which are located in various locations throughout Norway.

There is a number of free web-based survey tools available on the Internet. Some require payment for advanced functions while some provide them free with limitations. After the researcher considered some survey software and discussed options with her supervisor, QuestBack (http://www.questback.com/) was chosen for this research for certain reasons. First, Høgskolen i Oslo (Oslo University College) has received a free license from QuestBack to support students and faculty conducting research. Second, several faculty members have experience using the program and can share their solutions if the researcher faces some particular problems. Moreover, QuestBack's features are easy to use and the company provides easy-to-understand tutorials and a manual for its users. Finally,

QuestBack allows exporting raw data to several file formats such as word documents (.doc), presentation slides (.ppt), spreadsheets (.xls), and SPSS (.sav).

3.4 Method of Data Collection

The following section describes the procedure used to collect data by presenting it as a series of steps.

3.4.1 Collecting Relevant Information

The researcher first collected information related to metadata practices and digital photographic collections and projects in general and specifically in Norway from books, articles, theses, research reports, Internet resources, and full-text databases in order to obtain a greater understanding of the topic.

3.4.2 Constructing the Questionnaire

Then, a questionnaire as a data collecting tool was designed and created. It consisted of three sections for acquiring data on the metadata practices of digital photographic collections in archives, libraries, and museums in Norway. The details of these sections have already been described in section 3.3 on the data collection instrument.

3.4.3 Pilot Testing

Pilot testing is one of the most significant elements of research. Creswell (2003, p. 158) states that "…the testing is important to establish the content validity of an instrument and to improve questions, format, and the scales…"

In the pilot study, a test was administered from 25 February 2010 to 7 March 2010 by requesting staff in archives, libraries, and museums in Thailand that have digital photographic collections to fill in the questionnaires. The following institutions participated in the pilot study:

1. Princess Maha Chakri Sirindhorn Anthropology Centre
2. National Archives in Commemoration of H.M. the King's Golden Jubilee
3. Chulalongkorn University. Memorial Hall.
4. Silapakorn University Library, Thapra Campus
5. Sukhothai Thammathirat Open University. Information Resource Center
6. Thai Bank Museum. Siam Commercial Bank

Further, Per Olav Torgnesskar and Oddrun Pauline Ohren, staff at ABM-utvikling who are experts in photographic collections were kindly requested to read and comment on the

questionnaire. After that, the comments and recommendations are very helpful to amend the data collecting tool.

3.4.4 Revising The Tool

Comments and recommendations from pilot test respondents and the staff of the ABM-utvikling were taken into consideration and the content, response format, question sequence, and layout of the questionnaire were amended accordingly. The questionnaire was developed carefully to ensure that questions were clear and unambiguous and can collect all the required information. After the questions were refined, the questionnaire was transformed into a Web-based format by utilizing QuestBack's survey tool. To ensure the comprehensiveness and readability of in the online version of the questionnaire, the researcher revised it again, paying special attention to the layout, by considering question phrasing, the length of questionnaire, and the feelings of the target respondents which might affect the response rate.

3.4.5 Collecting Data

After the content and layout of the online questionnaire was perfected, the researcher distributed the online survey link via the QuestBack invitation system to the potential respondents' email addresses directly and kindly requested that they complete the questionnaire sometime between April 12 and April 25, 2010. Additionally, the cover letter was translated into Norwegian in order to facilitate understanding of the aims of the study for the respondents and to persuade them to contribute their time. Professor Dr. Michael Preminger, the supervisor, kindly translated the cover letter to Norwegian.

On April 25, 2010, there were a total of 29 returned questionnaires. Therefore, the researcher decided to extend the deadline to May 5, 2010, and sent a reminder letter to potential respondents again in order to receive more responses. By the end of the survey distribution period, the researcher had received 45 responses in total.

3.5 Data Analysis

Data collected from research surveys are usually quantitative or numerical. Closed-ended questions especially tend to yield quantitative results. Although numerical data are presented in this study, only descriptive statistics such as frequency distribution, percentage, mean, and standard deviation were used to reflect the qualitative nature of the study. In addition to closed-ended questions, the survey was comprised of open-ended

questions in order to gather detailed explanations and reasons from the respondents. The data obtained from this kind of question enabled the researcher to understand the findings more comprehensively and interpret them more accurately.

As mentioned, the number of willing respondents was determined through purposive sampling. As a result, there may be a risk of possible bias due to patterns in the response rate. Thus, the researcher has taken this possibility into consideration and views the results with caution. Besides, the findings might not be generalizable to every archive, library, and museum in Norway.

The data were analyzed simply by using QuestBack's analyze function into descriptive statistics such as frequency distribution, percentage, mean, and standard deviation. However, the Statistical Package for the Social Sciences (SPSS) program was employed to correct, code, and analyze the collected data again. Further, SPSS enhances the analysis capabilities of the researcher to obtain more interesting findings. Through the QuestBack system, the collected data can be exported into .sav file, which saves time for coding and analyzing data.

The close-ended questions consist of single-selected, multi-selected, and rating scale types. For most closed-ended questions in sections 1 – 3, responses were analyzed according to frequency distribution and percentage. In addition, there are some Likert-scale questions which had to be coded, analyzed and interpreted as follows:

1. "Very unimportant," "somewhat unimportant," "somewhat important," and "very important" are coded as

Very unimportant = 1
Somewhat unimportant = 2
Somewhat important = 3
Very important = 4

After that, is the results were analyzed into mean and standard deviation (S.D.) according to the following interpretation:

3.51 – 4.00 means Very important (VI)
2.51 – 3.50 means Somewhat important (SI)
1.51 – 2.50 means Somewhat unimportant (SU)
1.00 – 1.50 means Very unimportant (VU)

2. For “never,” “little,” “much,” and “a great deal,” the “never” responses were removed from the frequency and percentage calculations and analyzed separately. “Little,” “much,” and “a great deal” were coded as

Little = 1

Much = 2

A great deal = 3

Then the results were analyzed into mean and standard deviation (S.D.) according to the following interpretation:

2.50 – 3.00 means A great deal (AGD)

1.51 – 2.51 means Much (M)

1.00 – 1.50 means Little (L)

For open-ended questions, collected data were translated into English and then were analyzed by the use of content analysis. These results are presented in order of frequency.

Finally, the results of the data analysis are illustrated in tables with explanations and a discussion in Chapter 4. Conclusions and recommendations are described in Chapter 5. Out of respect for the anonymity of respondents, the findings are presented without mentioning names or distinguishing characteristics of individuals or institutions.

3.6 Limitation of the Study

There are three limitations that need to be addressed regarding this research. The first limitation is concerned with the generalizability of the study. Due to the lack of a census of archives, libraries, and museums in Norway which have digital photographic collections, the sample group was selected purposely based on a few available documents and the supervisor’s personal work network. In addition, there were only 45 institutions participating in the study. As the numbers of respondents in each category – for archives and libraries, especially, the numbers are low and so drawing conclusions based on them might be difficult. Therefore, the data cannot represent and generalize accurately the current state of metadata practices of digital photographic collections in each memory institution type in Norway.

Another limitation of the study is the online version of the data collecting tool. The respondents might have become impatient with the four-page online English questionnaire (with 34 questions), because completing the questionnaire required approximately 25-30

minutes. Furthermore, the staffs of memory institutions are probably busy with their routine work. Accordingly, some refused to participate in the research or might not have answered carefully. Therefore, the results may have been affected. Moreover, distributing questionnaires via email could have affected the response rate. The recipients might have ignored the survey invitation email from an unknown person.

Finally, language is another limitation. All questions were written in English. Also, there were several technical terms such as metadata scheme, metadata type, or descriptive metadata. These might have led to some misunderstanding because the respondents were probably non-native English speakers. Therefore, questionnaires in Norwegian would probably increase the response rate. In addition, some questions allow the respondents to answer in English or Norwegian. The responses in Norwegian were received and translated. However, it is still difficult to understand and interpret the respondents' opinions accurately without bias.

CHAPTER 4
DATA ANALYSIS AND DISCUSSION

This chapter presents findings collected from the questionnaire. This research project aims to explore metadata practices for digital photographic collections in archives, libraries, and museums in Norway by using a descriptive survey research method.

The researcher received 45 responses from online questionnaires via the online survey program QuestBack from archives, libraries, and museums in Norway which have digital photographic collections. Then, the raw data from QuestBack was exported to the SPSS (Statistical Package for the Social Sciences) file format in order to correct the data and enable further analysis of the data. Therefore, SPSS for Windows was used to analyze the collected data by using descriptive statistics analysis tools such as frequency distribution, percentage, mean, and standard deviation. The results are ordered as tables with explanations and can be divided into three sections:

Section I: Characteristics of respondents and digital photographic collections

Section II: Current state of metadata practices for digital photographic collections in Norway

Section III: Problems and opinions on cataloging digital photographic collections

4.1 Characteristics of Respondents and Digital Photographic Collections

This section presents the information collected on the respondents and the organization of digital photographic collections in terms of cataloging database systems, reasons for digitizing photographic materials, source materials for digitization, online availability, and other digital collections in their repositories.

4.1.1 Respondent Characteristics

The researcher received 45 returned online questionnaires in total. In detail, they can be divided into three memory institution types: 7 archives (15%), 6 libraries (13%), and 32 museums (71%). (See Table 4.1.1)

Table 4.1.1 Respondents Categorized by Memory Institution Types

Respondents	Total	
	(N = 45)	(100%)
Archive	7	15%
Library	6	13%
Museum	32	71%

Table 4.1.2 Experience on Cataloging Digital Photographic Collection Divided by Memory Institution Type

Experience on Cataloging Digital Photographic Collections	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 5)	Museum (N = 32)	(N = 44)	(100%)
less than 1 year	0	0	4	4	9%
1 – 3 years	3	0	8	11	25%
4 – 6 years	1	0	5	6	14%
more than 6 years	3	5	15	23	52%

As shown in Table 4.1.2, most memory institutions in this survey (23 institutions, or 52%) have more than six years of working experience on cataloging digital photographic collections. Six institutions (14%) have four to six years of experience and eleven institutions (25%) have one to three years of experience. Few respondents (4 institutions, 9%) have less than one year of experience cataloging digital photographic collections.

4.1.2 Cataloging Database System for Digital Photographic Collections

Table 4.1.3 Cataloging Database System for Digital Photographic Collections

Cataloging Database System for Digital Photographic Collections	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 5)	Museum (N = 31)	(N = 43)	(100%)
PhotoStation	3	0	2	5	12%
Primus	0	0	22	22	51%
Bibliofil	0	4	0	4	9%
Mikromarc	1	0	0	1	2%
Aleph	0	0	0	0	0%
Asta	0	0	0	0	0%
Other	3	1	7	11	26%

Table 4.1.3 shows that a slight majority of memory institutions represented in the data use Primus as their cataloging database system for digital photographic collections. PhotoStation is used by five institutions (12%) and Bibliofil by four institutions (9%). Over a quarter of institutions used other programs. However, the results are quite different for each type of memory institution. In Norway, Primus is assigned by national infrastructure policy to the museum community while Bibliofil is used in the library community and PhotoStation is often used by the archive community.

In addition to the above-mentioned cataloging database systems, some respondents reported using other systems as follows: their own developed system based on FileMaker (one answer), their own developed system but will change to Primus soon (one answer), WinRegimus but will use Primus soon (two answers), CDs but will use Primus, (one answer), Bibliofil and Excel in combination with Flickr (one answer), MAVIS (an Australian archival program one answer), Primus and their own developed system (one answer), Kulturnett Sogn og Fjordane (two answers), and Fotoman (one answer).

4.1.3 The Main Reasons for Digitizing Photographs

The most frequently chosen "main reason" for digitizing photographs, given by the respondents from all memory institution types, is "to improve accessibility" (93%). The second most frequently chosen reason is "to preserve the originals" (78%), followed by "to increase information sharing" (62%). "To support educational and research activities" is the least frequently chosen reason (56%). However, there are four additional reasons written in by respondents: to preserve information on the holdings (two answers), to use in books and other publications (one answer), to reduce handling (one answer) and institutions' interest (1 answer). Reasons do not seem to differ according to type of memory institution. This data is shown in Table 4.1.4.

Table 4.1.4 Main Reasons for Digitizing Photographs Divided by Memory Institution Type

The Main Reasons for Digitizing Photographs	**Type of Memory Institution**			**Total**	
	Archive (N = 7)	**Library (N = 5)**	**Museum (N = 32)**	**(N = 42)**	**(%)**
To preserve the originals	6	4	25	35	78%
To support educational and research activities	3	3	19	25	56%
To improve accessibility	7	5	30	42	93%
To increase information sharing	4	2	22	28	62%
Other	1	0	3	4	9%

4.1.4 Source Materials of the Digital Photographic Collections

The vast majority of participating institutions responded that source materials for their digital photographic collections come from photographic prints (91%) and film negatives (84%). Slides and glass negatives were also chosen as source materials for digitization by more than half of the respondents (71% and 62%, respectively). In addition to these choices, the respondents indicated that their digital photographic collections consisted of digital-born originals (three answers), Polaroid items (one answer), old postcards (one answer), and daguerreotypes and ambrotypes (one answer).

Table 4.1.5 Source Materials of the Digital Photographic Collections Divided by Memory Institution Type

Source Materials of the Digital Photographic Collections	**Type of Memory Institution**			**Total**	
	Archive (N = 7)	**Library (N = 6)**	**Museum (N = 32)**	**(N = 45)**	**(%)**
Photographic prints	7	5	29	41	91%
Film negatives	6	4	28	38	84%
Glass negatives	5	3	20	28	62%
Slides	3	2	27	32	71%
Other	2	1	3	6	13%

4.1.5 Published Online Digital Photographic Collections

Most of the memory institutions represented in the data indicated that their digital photographic collections were not published on the Internet but they have plans to do so (52%) while 43 % of respondents already published their collections online. However, from Table 4.2.4, it can be shown that archive and library respondents were more likely to have published their collections online (five archives and five libraries). In the responding museum community, fewer institutions have published digital photographic collections online (only nine). Accordingly, most museum respondents have a plan to do so (21 institutions). In addition, two museums do not publish online and explain that they have not formulated plans to do so yet (one answer) and one institution does not publish their collection online out of a concern for security (one answer). (See Table 4.1.6)

Table 4.1.6 Published Online Digital Photographic Collections Divided by Memory Institution Type

Are Digital Photographic Collections Published Online?	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 5)	Museum (N = 32)	(N = 44)	(100%)
Yes	5	5	9	19	43%
Not now, but have a plan	2	0	21	23	52%
No	0	0	2	2	5%

4.1.6 Other Digital Collections in Memory Institutions

Among the respondents, 27 institutions (64%) respond that they also have other digital collections under their responsibility and 15 institutions (36%) do not have other digital collections. (See Table 4.1.7)

Table 4.1.7 Other Digital Collections in the Holdings Divided by Memory Institution Type

Do You Have Other Digital Collections?	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 5)	Museum (N = 30)	(N = 42)	(100%)
Yes	6	2	19	27	64%
No	1	3	11	15	36%

4.2 Current State of Metadata Practices for Digital Photographic Collections in Norway

This section reports the responses to questions on metadata practices for digital photographic collections in Norway in the areas of opinions on cataloging photographs in digital versus other formats, the availability of guidelines at workplace, metadata creators, chief source of information for cataloging photographs, awareness of the importance of metadata and metadata types, metadata schemes and subject cataloging standards for digital photographic collections, and the most important core elements for digital photographic collections.

4.2.1 Opinions on Cataloging Photographs in Digital versus Other Formats

Memory institutions have collected photographic materials in various formats such as prints, slides, films, and digital files. The response is able to reveal the viewpoint of the institution on the question of whether cataloging digital photographs is the same or different from cataloging images in other formats. Most of the responding memory institutions think cataloging digital photographs is similar to cataloging photographs in other formats (80.5%) while a few responding institutions think it is different (19.5%). (See Table 4.2.1)

Table 4.2.1 Opinion on Cataloging Photographs in Digital versus Other Formats

Cataloging Photographs in Digital Format is SIMILAR or DIFFERENT from Cataloging Photographs in Other Formats?	**Type of Memory Institution**			**Total**	
	Archive (N = 7)	**Library (N = 6)**	**Museum (N = 28)**	**(N = 41)**	**(100%)**
Similar to cataloging photographs in other formats	6	6	21	33	80.5%
Different from cataloging photographs in other formats	1	0	7	8	19.5%

The respondents were also requested to provide reasons to support their responses. Some respondents stated that the process and the objective of cataloging photographs is the same, no matter what the format; the image medium is the "carrier." Below are a few typical responses: (See Appendix 2 for all statement of reasons)

> *"It is similar as it is still an image that has been taken by somebody and that shows something on a specific time and place. The difference is only the carrier."* [Institution #22 – Library]

> *"The reason for cataloging photographs is to be able to retrieve them in a simple way, whatever format."* [Institution #19 – Museum]

In addition, describing photographic items should emphasize providing efficient access points and access links because

"The subject is most important in the cataloging process, not the type specimen" [Institution #3 – Museum]

Even if cataloging digital and analog photographs is the same, technical data on the digital format is increasingly important.

"No. Either - or. Main content cataloging information is the same, in digital formats file info is necessary, in other formats factual information on the object is required." [Institution #18 - Library]

On the contrary, some institutions pointed out that there are some critical differences between cataloging digital photographs and photographs in other formats, particularly in terms of metadata elements, as follows:

"Mainly similar to cataloging analog formats when registering information in Primus. However, digitally created photos will not need to be scanned. For this reason, there is a difference in "eksemplar-/materialinfo" (pixles and not centimeters) and in "administrativ info" (e.g. authentication/clause) - which digitally created photography is "the original" as one can make "hundreds" of copies of a photo file, and even alter a file almost without trace?" [Institution #33 – Museum]

It can be reported that cataloging photographs is the same, no matter format they are. Cataloging is to provide sufficient data of and about the resource to be comprehensive and sensible to users. Then, how to describe and what they have to describe remains the same. However, digital format can affect cataloging in terms of providing technical data, as reported.

4.2.2 Guidelines in Place for Cataloging Digital Photographic Materials

Table 4.2.2 Guidelines for Cataloging Digital Photographic Collections Divided by Memory Institution Type

Does Your Institution Have Guidelines for Cataloging Digital Photographic Collections?	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 5)	Museum (N = 32)	(N = 44)	(100%)
Yes, in print format	4	2	15	21	48%
Yes, published online	1	2	3	6	14%
No	2	1	4	7	16%
Not now, but plan to do it soon	0	0	10	10	23%

According to Table 4.2.2, the findings illustrate that the majority of responding memory institutions (62% in total) have guidelines for cataloging digital photographic collections. Twenty-one institutions (48%) have guidelines in print format and six institutions (14%) have guidelines published online. Seventeen institutions (39% in total) do not have guidelines in place, however ten of them (23% of respondents) plan to have guidelines in place soon.

4.2.3 Metadata Creators of Digital Photographic Collections

With respect to metadata creation, who is involved in describing digital photographic materials? Institutions could, and frequently did, choose more than one answer. The findings reveal that archivists (56%) are the major group of metadata creators for digital photographic collections according to participating memory institutions. Next are curators and catalogers (38% and 36%, respectively). However, one should be aware that the findings of metadata creator in general could be different if there were more responses from the library and archive communities.

In particular, archive respondents state that an archivist is mostly chosen to be the metadata creator (seven out of seven archives). Catalogers tended to be chosen by the respondents from the library community (two libraries out of six) whereas archivists and curators were chosen most frequently by museum respondents (17 of 32 museums for each response). (See Table 4.2.3)

In addition, thirteen institutions added other metadata creators of digital photographic collections such as photographers (four answers), other engaged and trained staff (four answers), volunteers under the supervision and guidance of staff (two answers), a librarian (one answer), a historian (one answer), and historical organizations (one answer).

Table 4.2.3 Metadata Creators of Digital Photographic Collections Divided by Memory Institution Type

Who Catalogs the Items in the Collection?	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 6)	Museum (N = 32)	(N = 45)	(%)
Cataloger	2	2	12	16	36%
Archivist	7	1	17	25	56%
Curator	0	0	17	17	38%
IT staff	0	1	2	3	7%
Other	4	2	7	13	29%

4.2.4 Chief Sources of Information for Cataloging Digital Photographic Items

Table 4.2.4 Chief Sources of Information for Cataloging Digital Photographic Items

Chief Source of Information for Cataloging Digital Photographic Items	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 6)	Museum (N = 32)	(N = 45)	(%)
Material itself or its packaging	6	4	27	37	82%
Researchers	3	3	14	20	44%
Doing fieldwork	3	4	16	23	51%
Other	4	2	4	10	22%

Table 4.2.4 indicates that the material itself or its packaging is the most cited chief source of information (82%) for cataloging digital photographic items by the respondents. Next is by doing fieldwork (51%) and researchers (44%).

In detail, archive and museum respondents use mostly the material itself or its packaging as a chief source of information (six archives and 27 museums). However, library respondents consult mostly the material itself or its packaging (four libraries) and do fieldwork equally (four libraries).

Moreover, the respondents give other chief sources of information such as reference literature such as encyclopedias and biographies (two answers), other archival materials (two answers), old catalogs (two answers), image owners/donors (two answers), local knowledge of the organization (one answer), maps (one answer), and informants (one answer). Further, one institution gives a comment that there is no Bible for cataloging digital photographic items, probably meaning that there are no proscribed sources.

4.2.5 Awareness of the Importance of Metadata

The respondents were asked to rate the level of their awareness of the importance of metadata for digital photographic projects on the following scale: very unimportant, somewhat unimportant, somewhat important, or very important.

Table 4.2.5 illustrates the average and standard deviation of the awareness of the importance of metadata as claimed by the respondents. It can be seen that the respondents think metadata are very important for digitizing projects (mean = 3.53).

In detail, both library and museum respondents have approximately the same level awareness. In their view, metadata is very important (mean = 3.80 and 3.58, respectively) whereas archive respondents think it is somewhat important (mean = 3.14).

Table 4.2.5 Awareness of the Importance of Metadata for Digital Photographic Projects Divided by Memory Institution Type

Type of Memory Institution	**Awareness of Importance of Metadata**		
	Mean	**S.D.**	**Interpretation**
Archive (N=7)	3.14	1.21	Somewhat important
Library (N=5)	3.80	0.45	Very important
Museum (N=31)	3.58	0.72	Very important
Total (N=43)	**3.53**	**0.80**	**Very important**

4.2.6 Importance of Metadata Types for Organizing Digital Photographic Collections

Table 4.2.6 Importance of Metadata Types for Organizing Digital Photographic Collections

Memory institution types / Metadata Type	Archive (N=7)		Library (N=6)		Museum (N=32)		Total (N=45)	
	$\overline{X}$	S.D.	$\overline{X}$	S.D.	$\overline{X}$	S.D.	$\overline{X}$	S.D.
Descriptive metadata (N= 42)	3.43 (SI)	1.13	3.60 (VI)	0.55	3.47 (SI)	0.86	**3.48 (SI)**	**0.86**
Administrative metadata (N= 41)	3.14 (SI)	0.69	2.60 (SI)	0.89	3.24 (SI)	0.87	**3.15 (SI)**	**0.85**
Structural metadata (N= 40)	2.57 (SI)	0.79	3.00 (SI)	0.71	2.57 (SI)	0.92	**2.63 (SI)**	**0.87**

Table 4.2.6 represents the average and standard deviation of the importance of metadata types for organizing digital photographic collections from the responding memory institutions' viewpoints. It can be clearly seen that descriptive metadata, administrative metadata, and structural metadata are all somewhat important in the respondents' opinions. However, descriptive metadata, which aims to identify and describe collections and resources), is rated with the highest mean among these three metadata types (mean = 3.48); followed by administrative metadata (mean = 3.15), which aims to help manage a resource, e.g., acquisition information, rights, reproduction, and location; and structural metadata (mean = 2.63), which aims to describe how an item is structured, e.g., its format, hardware and software, and authentication data.

Considering each memory institution type, archive and museum respondents seem to have roughly the same viewpoint on the importance of every metadata type by rating them with the level "somewhat important." The highest mean rating of metadata type for archive and museum respondents is descriptive metadata (mean = 3.43 and mean = 3.47 respectively). On the contrary, library respondents rate descriptive metadata as "very important," with the highest mean (3.60), and other metadata types as "somewhat important" (structural metadata mean = 3.00; administrative metadata mean = 2.60). It can be assumed that library respondents are most concerned the role of descriptive metadata on their collections. However, descriptive metadata is rated with the highest mean from every

memory institution types. This can reflect the nature of memory institutions tasks which are collecting, organizing, and providing access to the resources. Then resource discovery is the most important.

4.2.7 Adopted Metadata Schemes for Digital Photographic Collections

Digital photographic collection projects in responding memory institutions in Norway have adopted various metadata schemes to organize their collections. *Standard for Fotokatalogisering* (Standard for Cataloging Photographs) is the most used metadata scheme (69%), followed by MARC (11%), Dublin Core Metadata Element Set (DCMEs) (7%), and Encoded Archival Description (EAD) (2%). No memory institution adopts the Visual Resources Association (VRA) core and Categories for Description of Works of Art (CDWA).

However, eight respondents reported using other metadata schemes: A mix of customized and local standards (four answers), local standard based on *Standard for Fotokatalogisering* (one answer) and "Feltkatalogen" in FotoMan (one answer) and not currently use any (two answers). (See Table 4.2.7)

Table 4.2.7 Metadata Schemes Used for Digital Photographic Collections Divided by Memory Institution Type

Metadata Schemes used for Digital Photographic Collections	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 6)	Museum (N = 32)	(N = 45)	(%)
MARC	1	4	0	5	11%
Dublin Core Metadata Element Set (DCMEs)	0	1	2	3	7%
Encoded Archival Description (EAD)	0	0	1	1	2%
Visual Resources Association (VRA) Core	0	0	0	0	0%
Categories for the Description of Works of Art (CDWA)	0	0	0	0	0%
Standard for fotokatalogisering (Standard for Cataloging Photographs)	5	3	23	31	69%
Other	2	0	6	8	18%

Standard for Fotokatalogisering (Standard for Cataloging Photographs) is most frequently adopted as a metadata scheme by the respondents for several reasons. Memory institution respondents who use this metadata scheme reported that they did so because it is supported by leading organizations (42%), it is widely used (29%), and it is simple and easy to use (18%). (See Table 4.2.8)

Table 4.2.8 Reasons Why Institutions Chose *Standard for Fotokatalogisering* (Standard for Cataloging Photographs) as their Metadata Scheme for Digital Photographic Collections

Reasons Why *Standard for Fotokatalogisering* (Standard for Cataloging Photographs) Was Chosen	**Responding Memory Institutions which Used this Metadata Scheme**	
	(N = 31)	**(%)**
It is flexible and extensible	6	13%
It is simple and easy to use	8	18%
It supports information sharing	7	16%
It is widely used	13	29%
It is supported by leading organizations	19	42%
Previous experience	5	11%
Other	2	4%

As for respondents in general, their decision to choose the metadata scheme they use is mostly because it is supported by leading organizations (47%). The second most-chosen reason is that it is widely used (36%), followed by consideration for a simple and easy-to-use metadata scheme (27%).

In particular, the reasons chosen most by archive respondents are that their chosen standard is flexible and extensible (three archives) and it is supported by leading organizations (three archives). Respondents from the library community chose their metadata schemes because it supports information sharing (four libraries), it is widely used (four libraries), and it is supported by leading organizations (four libraries). However, the most frequently given reason why museum respondents chose their metadata scheme is that it is supported by leading organizations (21 museums) and it is widely used (16 museums).

Additionally, three respondents gave another reason: they have no choice because it is dominated by cataloging database systems such as Mikromarc and Primus. (See Table 4.2.9)

Table 4.2.9 Reasons Why Metadata Schemes for Digital Photographic Collections were Chosen, by Memory Institution Type

Reasons Why Metadata Scheme was Chosen	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 6)	Museum (N = 32)	(N = 45)	(%)
It is flexible and extensible	3	1	2	6	13%
It is simple and easy to use	2	3	7	12	27%
It supports information sharing	2	4	4	10	22%
It is widely used	2	4	10	16	36%
It is supported by leading organizations	3	4	14	21	47%
Previous experience	2	2	4	8	18%
Other	1	0	2	3	7%

The respondents were further asked whether they applied their adopted metadata scheme for digital photographic collections to other digital collections. Table 4.2.10 shows that there are almost the same number of responding institutions which use the same metadata scheme for both digital photographic collections and other digital collections as those that use different metadata schemes for each digital collection. (the same metadata scheme: 11 answers, or 39%; different metadata scheme: 10 answers, or 36%). However, when considering each particular metadata scheme, it can be shown that MARC and DCMES are used for other digital collections whereas *Standard for Fotokatalogisering* is less commonly used for other digital collections. (See Table 4.2.10)

Table 4.2.10 Use of Digital Photographic Collection Metadata Scheme with Other Digital Collections

Is That Metadata Scheme Used for Other Digital Collections?	Metadata Schemes for Digital Photographic Collections							Total	
	MARC (N=2)	DCMEs (N=2)	EAD (N=0)	VRA (N=0)	CDWA (N=0)	Standard Fotokatalogisering (N=23)	Other (N=4)	(N = 28)	(100%)
Yes	1	2	0	0	0	7	0	10	36%
No	0	0	0	0	0	11	2	11	39%
Not applicable	1	2	0	0	0	5	2	7	25%

4.2.8 Subject Cataloging Standards for Digital Photographic Collections

Apart from descriptive data, memory institutions provide subject headings and keywords as access points to facilitate the retrieval of needed resources by users. This survey reports that most of the respondents use free keywords instead of controlled vocabularies for subject cataloging of digital photographic collections (71%). Two museums use *Ordnøkkelen – Thesaurus for kulturminnevern* (4%). Further, additional subject cataloging standards are used by some of the responding institutions, such as *Outline of Cultural Material*[1] (four answers), *AACDII*[2] (one answer), their own local list for specific use, (one answer), their own local thesaurus (one answer), *Bibbi-emner (Biblioteksentralen*) (one answer), and *Emneordliste for Fotonettverk Rogaland* (one answer). One additional respondent reports using *Ordnøkkelen* with *TGM II* (LC Thesaurus for Graphic Materials II) but wishes to have specific subject headings for historical photographs. (See Table 4.2.11)

Table 4.2.11 Subject Cataloging Standards Used for Digital Photographic Collections Divided by Memory Institution Type

Subject Cataloging Standards	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 6)	Museum (N = 32)	(N = 45)	(%)
Library of Congress Subject Headings	0	0	0	0	0%
Ordnøkkelen – Thesaurus for Kulturminnevern	0	0	2	2	4%
Art & Architecture Thesaurus	0	0	0	0	0%
Free keywords – no controlled vocabularies	7	4	21	32	71%
Other	0	3	7	10	22%

Furthermore, the findings show that the above-selected standards for subject heading lists are used for both digital photographic collections and other digital collections by 44% of

[1] Outline of Cultural Material is a classification system. However, probably the respondents use this system to guide subject cataloging and assign subject headings.
[2] AACD = AACR2 is a descriptive cataloging standard in Norwegian version.

respondents. Nine respondents do not use free keywords for other digital collections whereas eight do. (See Table 4.2.12)

Table 4.2.12 Subject Cataloging Standards for Digital Photographic Collection Used for Other Digital Collections

Is That Standard for Subject Headings Used for Other Digital Collections?	Subject Cataloging Standard					Total	
	LCSH (N = 0)	Ordnøkkelen (N = 0)	AAT (N = 0)	Free keywords (N=21)	Other (N = 7)	(N = 28)	(%)
Yes	0	0	0	8	5	13	44%
No	0	0	0	9	1	10	36%
Not applicable	0	0	0	4	1	5	18%

Tagging is a new approach to provide subject access to digital collections by users for themselves. There are currently several projects allowing users to provide keywords or tags freely. Therefore, the respondents were asked whether or not they currently allow users to tag their photographic materials.

According to Table 4.2.13, it can be reported that the majority of respondents do not allow users to tag their digital photographic collections (58%). However, some responding memory institutions are planning to do it soon (29%). Only a handful (five institutions) allows users to tag digital images currently.

Table 4.2.13 Tagging Digital Photographic Records

Does Your Institution Allow Users to Tag the Digital Photographic Collections?	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 5)	Museum (N = 29)	(N = 41)	(100%)
Yes	1	0	4	5	12%
Not now, but plan to do it soon	2	4	6	12	29%
No	4	1	17	24	58%

4.2.9 The Most Important Core Elements for Digital Photographic Materials

The section aimed to find out the perspectives of archive, library, and museum respondents on the core elements[3] for cataloging digital photographic materials based on the standard fields in *Standard for fotokatalogisering* (Standard for Cataloging Photographs). The standard categorizes the core elements into four groups:

1) Identification and Provenance (Identifikasjon og Proveniens)

2) Motive and Content Information (Motiv- og Innholdsinformasjon)

3) Copies and Material Information (Eksemplar- og Materialinformasjon) and

4) Administrative Information (Administrativ Informasjon).

The results are presented in the following sections.

The Core Elements for Identification and Provenance (Identifikasjon og Proveniens)

In the category of Identification and Provenance (Identifikasjon og Proveniens), there are seven elements: "identifier* (Identifikator)", "alternative identifier (Alternative identifikator)", "title* (Tittel)", "alternative title (Alternative tittel)", "hierarchy level/detection level* (Hierarkinivå/registreringsnivå)", "relationship (Relasjoner)", and "name attached to the origin, ownership and management* (Navnknyttet til opphav, eierskap og forvaltning)" (*these elements are mandatory).

The findings reveal the most important elements in this category from the respondents' perspectives are "name attached to the origin, ownership and management" (71%), "identifier" (64%), and "title" (47%). In detail, there are small differences among the respondents from the archive, library, and museum communities. The most important element for archive respondents is "identifier" (six archives), while "title" is the most important element for library respondents (four libraries) and the most important element for museum respondents is "name attached to the origin, ownership and management" (25 museums).

[3] The term "core element" refers to "a set of most commonly occurring elements that could be used to enhance resource discovery and interoperability" as defined by the IFLA Working Group on the Use of Metadata Schemas.

Moreover, there are additional important elements suggested by some respondents: archive name (one answer), photographer (Fotograf) (one answer), individual numbers (one answer), history[4] (Historikk) (two answers), photography (Fotografering – which year the photograph is taken and by whom) (one answer), ownership (Eierskap – previous owner) (one answer), and use (Bruk - where and by whom) (one answer). (See Table 4.2.14)

Table 4.2.14 The Most Important Core Elements for Identification and Provenance Divided by Memory Institution Type

The Most Important Core Elements for Identification and Provenance	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 6)	Museum (N = 32)	(N = 45)	(%)
Identifier	6	3	20	29	64%
Alternative identifier	1	2	4	7	16%
Title	2	4	15	21	47%
Alternative title	1	0	1	2	4%
Hierarchy level/Detection level	2	0	8	10	22%
Relationship	0	0	6	6	13%
Name attached to the origin, ownership and management	4	3	25	32	71%
Other	2	1	2	5	11%

The Core Elements for Motive and Content Information (Motiv- og Innholdsinformasjon)

The category of Motive and Content Information (Motiv- og innholdsinformasjon) consists of eight core elements: "motive and content description* (Motiv- og innholdsbeskrivelse)", "name associated with the subject/content* (Navn knyttet til motiv/innhold)", "place name* (Stedsnavn)", "motive date* (Motivdato)", "motive type (Motivtype)", "subject* (Emneord)", "classification (Klassifikasjon)", and "supplementary information (Utfyllende informasjon)" (*these elements are mandatory).

According to Table 4.2.15, based on the respondents' perspective, the most important elements are "motive and content description" (78%), "place name" (73%), "name

[4] The element "History (Historikk)" is already categorized as the core element in the category of Administrative Information (Administrativ Informasjon).

associated with the subject/content" (64%), and "Subject" (58%). In addition, respondents suggested work title (Verkstittel– one answer) and legal person (Juridiske personer– one answer) as among the most important elements in this category. Further, one respondent explains that place name (Stedsnavn) is the most important element for his institution because most users ask for photos by geographic name (one answer). Not only photo description but also subject headings, legal person, and place name are very important to ensure efficient retrieval (one answer). (See Table 4.2.15)

Table 4.2.15 The Most Important Core Elements for Motive and Content Information Divided by Memory Institution Type

The Most Important Core Elements for Motive and Content Information	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 6)	Museum (N = 32)	(N = 45)	(%)
Motive and content description	6	4	25	35	78%
Name associated with the subject/content	4	5	20	29	64%
Place name	4	5	24	33	73%
Motive Date	2	4	12	18	40%
Motive type	0	2	6	8	18%
Subject	3	4	19	26	58%
Classification	0	0	11	11	24%
Supplementary information	0	0	12	12	27%
Other	0	0	2	2	7%

The Core Elements for Copies and Material Information (Eksemplar- og Materialinformasjon)

For the category of Copies and Material Information (Eksemplar- og materialinformasjon), there are five core elements: "production date (Produksjonsdato)", "material description* (Materialbeskrivelse)", "target (Mål)", "condition (Tilstand)", and "rank* (Plassering)" (*these elements are mandatory).

The results inform us that "material description" (76%) is the most important element for cataloging photographic items, followed by "rank" (40%) and "condition" (36%). Considering each memory institution type, all of them agree that "material description" is the most important element in this category (See Table 4.2.16).

Other responses for the most important elements include photographer/photo treats (Fotograf/fotobehandler) (one answer) and ID number (one answer). Further, one respondent commented that the element "production date" (Produksjonsdato) is sometimes quite difficult to determine , especially for old photographs, so then the institution fills out all the date of admission instead (one answer).

Table 4.2.16 The Most Important Core Elements for Copies and Material Information Divided by Memory Institution Type

The Most Important Core Elements for Copies and Material Information	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 6)	Museum (N = 32)	(N = 45)	(%)
Production date	2	2	9	13	29%
Material description	4	4	26	34	76%
Target	1	2	9	12	27%
Condition	1	2	13	16	36%
Rank	3	2	13	18	40%
Other	1	1	1	3	7%

The Core Elements for Administrative Information (Administrativ Informasjon)

The category of Administrative Information (Administrativ informasjon) includes six core elements: "policy/copyright* (Klausul/opphavsrett)", "accession/growth (Aksesjon/tilvekst)", "history (Historikk)", "other administrative information (Andre administrative opplysninger)", "registrar and cataloging date* (Registrator og katalogdato)", and "imaging* (Bildegjengivelse)" (*these elements are mandatory).

Table 4.2.17 The Most Important Core Elements for Administrative Information Divided by Memory Institution Type

The Most Important Core Elements for Administrative Information	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 6)	Museum (N = 32)	(N = 45)	(%)
Policy/copyright	6	4	25	35	78%
Accession/growth	4	4	17	25	56%
History	4	2	15	21	47%
Other administrative information	0	0	6	6	13%
Registrar and cataloging date	1	1	13	15	33%
Imaging	0	1	7	8	18%
Other	0	0	0	0	0%

As shown in Table 4.2.17, the most important elements for Administrative Information according to the respondents are information on "policy/copyright" (78%), "accession/growth" (56%), and "history" (47%). For archive and museum respondents, the most important element is "policy/copyright" (six archives, 25 museums) whereas "policy/copyright" and "accession/growth" are the most important elements in the opinion of library respondents (four libraries each).

4.3 Problems and Opinions on Cataloging Digital Photographic Collections

This section reports the problems that the respondents have had with regard to cataloging digital photographic collections, factors affecting cataloging practices for digital photographic collections in the future, collaboration with other memory institutions, potential contributions to collaborative projects, support needed from relevant organizations, as well as additional comments and recommendations.

4.3.1 Problems Regarding Cataloging Digital Photographic Collections

The researcher listed some possible problems in relation to cataloging digital photographic collections as follows:

- Hard to decide which metadata standards to use (descriptive cataloging and subject cataloging)
- Several confusing metadata concepts: metadata types, mapping, crosswalk, etc.
- Difficult to determine which metadata elements are useful for users and staff
- Not enough existing data on the materials
- Cataloging digital collections demands specialized knowledge and skills
- Not enough available documentation at the workplace
- Documentation cannot ensure the consistency of cataloging
- Insufficient budget

The researcher asked the respondents to rate the extent of their experience with each potential problem on the Likert three-point scale: "little," "much," and "a great deal." The

respondents can clearly identify that they do not face a particular problem by selecting "never."

A few respondents indicated that they never faced some of the above-mentioned problems. The "not enough available documentation at the workplace" option was most often indicated as a problem they never faced (six institutions). Detailed information can be seen in Table 4.3.1

Table 4.3.1 Problems Memory Institutions Never Encounter

Problems	Type of Memory Institution			Total
	Archive (N = 7)	Library (N = 6)	Museum (N = 32)	(N = 45)
Hard to decide which metadata standards to use (descriptive cataloging and subject cataloging)	0	0	4	4
Several confusing metadata concepts: metadata types, mapping, crosswalk, etc.	1	0	3	4
Difficult to determine which metadata elements are useful for users and staff	0	0	4	4
Not enough existing data on the materials	0	0	2	2
Cataloging digital collections demands specialized knowledge and skills	0	0	2	2
Not enough available documentation at the workplace	0	1	5	6
Documentation cannot ensure the consistency of cataloging	0	2	1	3
Insufficient budget	0	1	2	3

According to Table 4.3.2, respondents noted that five problems gave them "much" difficulty, which can be ordered by mean as follows: "insufficient budget" (mean = 2.21), "not enough existing data on the materials" (mean = 1.83), "Cataloging digital collections demands specialized knowledge and skills" (mean = 1.68), "not enough available documentations at the workplace" (mean = 1.61), and "several confusing metadata concepts: metadata types, mapping, crosswalk, etc." (mean = 1.58). Other problems have a mean level of only "little."

In detail, the problems which the respondents from archive community encountered the most (with the highest mean) are "not enough existing data on the materials" (mean = 2.14) and "insufficient budget" (mean = 2.14). For the library respondents' views, the problems which they face the most (with the highest mean) are "several confusing metadata concepts: metadata types, mapping, crosswalk, etc." (mean = 1.80) and "not enough existing data on the materials" (mean = 1.80). "Insufficient budget" (mean = 2.32) is ranked as the most daunting problem the museum community faces. (See Table 4.3.2)

Table 4.3.2 Problems Regarding Cataloging Digital Photographic Collections Divided by Memory Institution Type

Memory institution type / Problems	Archive (N=7)		Library (N=6)		Museum (N=32)		Total (N=45)	
	$\overline{X}$	S.D.	$\overline{X}$	S.D.	$\overline{X}$	S.D.	$\overline{X}$	S.D.
Hard to decide which metadata standards to use (descriptive cataloging and subject cataloging) (N= 39)	1.29 (L)	0.49	1.40 (L)	0.55	1.41 (L)	0.50	**1.38 (L)**	**0.49**
Several confusing metadata concepts: metadata types, mapping, crosswalk, etc. (N= 36)	1.33 (L)	0.52	1.80 (M)	1.09	1.60 (M)	0.64	**1.58 (M)**	**0.69**
Difficult to determine which metadata elements are useful for users and staff (N=38)	1.43 (L)	0.79	1.60 (M)	0.89	1.31 (L)	0.55	**1.37 (L)**	**0.63**
Not enough existing data on the materials (N= 40)	2.14 (M)	0.69	1.80 (M)	0.84	1.75 (M)	0.70	**1.83 (M)**	**0.71**
Cataloging digital collections demands specialized knowledge and skills (N= 38)	2.00 (M)	0.63	1.60 (M)	0.55	1.63 (M)	0.63	**1.68 (M)**	**0.62**
Not enough available documentation at the workplace (N=36)	1.86 (M)	0.90	1.25 (L)	0.50	1.60 (M)	0.58	**1.61 (M)**	**0.64**
Documentation cannot ensure the consistency of cataloging (N=39)	1.57 (M)	0.53	1.00 (L)	0.00	1.28 (L)	0.45	**1.31 (L)**	**0.47**
Insufficient budget (N= 39)	2.14 (M)	0.90	1.50 (L)	0.58	2.32 (M)	0.82	**2.21 (M)**	**0.83**

Apart from the problems listed by the researcher, the respondents were requested to give other non-mentioned problems. The following statements are problems which responding memory institutions encountered: Time, Hardware, High number of objects to catalog,

Insufficient staff, Many different databases to deal with, and The database system is not designed particularly for registering photos, like PhotoStation (one answer each).

4.3.2 Factors Affecting Cataloging Practices for Digital Photographic Collections

In the respondents' opinions, there are several factors affecting cataloging practices for digital photographic collections. The survey reveals that factors chosen most often by memory institutions represented in the data are "user needs" (56%), "policy on digital photographic collection development" (53%), and "technology" (53%). Considering each memory institution type, the most frequently chosen factors affecting cataloging digital photographic collection among archive respondents is "user needs" (five archives). Library respondents consider "policy on digital photographic collection development", "technology", and "user needs" as the most cited factors (five libraries each). However, "policy on digital photographic collection development" is mostly chosen by museum respondents (17 museums). (See Table 4.3.3)

Some respondents gave other potential factors affecting cataloging practices for digital photographic materials, such as using applications for user tagging like Flickr (one answer) or new applications like Primus (one answer), the quality of work resources (one answer), the increasing number of staff (one answer), and budget (one answer).

Table 4.3.3 Factors Affecting Cataloging Practices for Digital Photographic Collections in the Future Divided by Memory Institution Type

Factors Affecting Cataloging Practices for Digital Photographs	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 6)	Museum (N = 31)	(N = 44)	(%)
Administrative infrastructure changes in your institution	2	1	13	16	36%
Policy on digital photographic collection development	2	5	17	24	53%
Descriptive and subject cataloging standards	3	3	8	14	31%
Increasing numbers of photographs	4	4	13	21	47%
Ongoing knowledge and skills	2	3	12	17	38%
Technology	3	5	16	24	53%
User needs	5	5	15	25	56%
Participating in a joint program	1	4	12	17	38%
Staff commitment	3	2	12	17	38%
Other	2	0	3	5	11%

4.3.3 Participation in a Joint Digital Photographic Collection Development Project

The research finds out that the majority of respondents participate in a joint digital photographic collection development project (68%). Almost all archive and library respondents participate in this kind of project (six archives; four libraries). More than half of museum respondents also state that they participate in a joint digital photographic collection development project (20 museums). (See Table 4.3.4)

Table 4.3.4 Participation in a Joint Digital Photographic Collection Development Project, Divided by Memory Institution Type

Participation in a Joint Digital Photographic Collection Development Project	Type of Memory Institution			Total	
	Archive (N = 7)	Library (N = 6)	Museum (N = 31)	(N = 44)	(100%)
Yes	6	4	20	30	68%
No	1	1	10	12	27%
Not applicable	0	1	1	2	5%

4.3.4 The Potential Contribution of Archives, Libraries, and Museums to Collaborative Digital Photographic Collection Projects

After asking whether responding memory institution participate in any joint project on digital photographic collections, the researcher tried to determine what the respondents can contribute to collaborative digital photographic collection projects in terms of cataloging and classification. Responses to this free-response question can best be categorized by memory institution type.

What Archive Respondents Can Contribute to Collaborative Projects

Two archive respondents indicated that they could share knowledge and experiences with other institutions. One of them explains that his institution has more than ten years of experience with the dissemination of photos on the Internet and also with users and cataloging digital images. Further, one archive respondent says they can contribute time, money and resources. Another archive reported that his institution has experience with cataloging and organizing for particular user groups such as disabled people. This has partly led to automatic conversion between different cataloging standards. Also, the institution has tools and a platform that it has offered to others. The institution has dealt with a number of copyright and privacy issues in connection with online publishing. This is an important issue in relation to Internet-based directory tools.

What Library Respondents Can Contribute to Collaborative Projects

Two library respondents reported that they could contribute their competencies on developing standards for cataloging in general and particularly in photography. Besides, they are pleasure to share their expertise and take part in relevant conferences and other events.

What Museum Respondents Can Contribute to Collaborative Projects

Museum respondents can share their competencies and extensive experience on relevant issues such as the development of digital collection management systems, using Primus, and digital museums for photos and museum objects (six answers). Sharing knowledge and experiences among the community can broaden its views on cataloging practices for digital photos. This will also be useful for collaborative projects with other institutions to solve problems relevant to cataloging digital photographic materials.

Another museum kindly contributes itself and its cataloging practices as a practical example. This museum shares ideas on cataloging photos. For instance, it is important to provide a long description/text, not only a place name and one motive-word (Subject terms). Doing this provides more chances find and retrieve needed photos.

Apart from sharing experiences, the museum respondents can offer fairly extensive and well-cataloged photographic materials (one answer). In addition, participating and developing the topic lists published on www.digitalmuseum.no is another contribution from the museum community (one answer).

In term of database management systems, there are several museums building their own simple systems for organizing digital photos. The systems are used only by employees and are made available only on request (one answer). In addition, one respondent explained that his institution developed its own logistics system for the management of big photo collections by covering logistical and administrative data and a module for registration and documentation of photography on the series level. However, it is quite difficult to digitize all 1.5 million photos. It requires time and manpower (one answer).

4.3.5 Support Needed from Relevant Organizations

Apart from sharing knowledge and experience, memory institution respondents also need supplementary support from relevant organizations. Therefore, answers to this question reveal what kind of support memory institutions need in order to improve their cataloging practices for digital photographic collections. The findings are categorized by memory institution type.

Support Required by Archive Respondents

Some respondents from archive community would like to have more practical standards and shared experiences from other institutions. For example, the summary and dissemination of practical experiences with how to register photographic materials, user experiences, and user-centered metadata should be provided in public or among relevant institutions. Further, archive respondents recommend that relevant organizations should develop a national standard of subject headings for photographic collections related to the national *Standard for Fotokatalogisering*. Additionally, the relevant organizations should promote the usage of these national standards for cataloging photographs by arranging workshops or seminars.

Support Required by Library Respondents

One library respondent would like a strong center in each region with proficient staff who can guide and initiate all kinds of projects for libraries and institutions, not only for technical guidance. Another respondent, in addition, reported that national standards applicable to both amateur and professional institutions are also needed.

Support Required by Museum Respondents

The respondents from the museum community would like a list of standardized subject headings for cataloging photographs (three answers) and authority lists in collaboration with the various communities (one answer). The standards should be flexible, clear, and concise so that they can be applied easily. Relevant publications should be promoted for public use as well.

With clear standards and concise policies, IT departments can develop good systems to catalog digital photographs which anyone can use. In addition, museum respondents need

user-friendly technology and systems for cataloging large quantities of photographs. Help developing Primus and Digital Museum is also needed and it should be provided more quickly than before.

The respondents also need financial support (three answers). Due to budget constraints and software costs, upgrading to Primus has been delayed. Apart from a higher budget, the museum respondents need more employees for digitization. Educating and training museum staff about digitizing is also necessary (two answers).

4.3.6 Comments and Recommendations

Eight participating memory institutions gave comments and recommendations to improve cataloging digital photographic collections. The recommendations can be categorized into the following general categories.

Developing National Standards and Promoting Standards Usage

Even though there are several standards for cataloging photographs, it is suggested to design and develop a nationally controlled vocabulary standard for registering cultural and historical photographs (one museum). It is recommended for relevant institutions to strongly promote the use of metadata standards among various memory institutions. Although the national *Standard for Fotokatalogisering* has been developed, it still has little influence on cataloging photographs in memory institutions. Therefore, it should be necessary to make memory institutions in Norway realize the importance of standardization and promote the standard usage in their cataloging practices (one archive). In addition, applying metadata standards can facilitate information retrieval (one library and one museum).

Using Social Networking Applications for Digital Photographic Collections

Flickr, a photo sharing website, has been used to increase access to valuable photo collections. One archive respondent explains that the institution actively uses Flickr to display its photo collection. It was inspired by the United States National Archive, the Library of Congress, and the Eastman Kodak company. In this respondent's view, Flickr is a supplement to his catalog (one archive).

Cataloging Database System

One memory institution recommends that a cataloging database system should be designed with an additional function to transfer cataloging data automatically from specific programs (like Primus) to digital files (metadata) (one museum).

4.4 Discussion

This study attempts to explore the current state of, and problems with, metadata practices for digital photographic collections in archives, libraries, and museums in Norway. As noted in Chapter 3, the findings might not be generalizable to the entire archive, library, and museum community in Norway although the collected data can nevertheless be useful. Consequently, the results collected from the survey data will be carefully discussed with caution. This discussion is divided into three sections.

4.4.1 Section I: Respondent Characteristics and Digital Photographic Collections

Most of the memory institutions participating in the survey are from museum sector. According to the survey on the current situation of digitization in the archive, library, and museum sectors in Norway (Gausdal, 2006), the digitization of photographs is expansively conducted in the museum community. Further, the majority of responding memory institutions have more than six years of working experience on cataloging digital photographic collections. Their considerable work experience enhances the ability of memory institutions in Norway to improve organizing and retrieving from digital collections in the future by sharing their knowledge and skills. Apart from photographic collections, 64% of the responding memory institutions have other digital collections as well.

Regarding the cataloging database systems used for digital photographic collections, the response is not surprising. Primus is the most used cataloging database system, followed by PhotoStation and Bibliofil. The findings reflect the divided nature of the archive, library, and museum sectors: each predominantly uses a unique cataloging database system to organize digital photographic collections. However, some respondents indicated that they design and develop their own systems for their collections.

The most cited main reason why responding memory institutions in Norway digitize photographs is to improve accessibility. This finding corresponds with Hughes (2004, p.265). Other main reasons for digitizing photographs include to preserve the originals and to increase information sharing. Further, Lopatin (2006) also states that the major reasons of initiating digitization projects in general are access and preservation of materials. With digitization, memory institutions can provide access to any materials especially rare, fragile, and unique ones via digital surrogates (Hughes, 2004).

Photographic prints are the most common original material digitized, followed by film negatives, slides, and glass negatives. Memory institutions are custodians of valuable information resources in various formats that need to be preserved for a long time. Since photographs in their holdings are mainly in print format which is easy to damage, responding memory institutions might prioritize their digitization.

Most respondents answer that now they do not publish their photographic collections on the Internet but have a plan to do so (52%) while 19 respondents say that their collections are published online (43%). According to a survey by Gausdal (2006), collections of photographs, artifacts, sound, film and video are not greatly accessible to the public, compared to collections of text. However, the findings of this research indicate that photographic collections are increasingly published and accessible to the general public online. Memory institutions in Norway have probably considered the benefits of available, easy-to-use, and low-cost information technology to improve their photographic collections. However, security concerns are also raised in the findings. How to provide access to copyrighted digital photographs under licensing agreements and with fair use should be examined and taken to consideration.

4.4.2 Section II: Current State of Metadata Practices for Digital Photographic Collections in Norway

- **Opinion on Cataloging Photographs in Digital and Other Formats**

In the opinion of memory institution respondents, cataloging digital photographic materials is similar to cataloging photographs in other formats. Some reasons are given by the respondents. As the format is only the carrier, cataloging objectives remain the same no matter which format photographs are in. Cataloging aims to describe items in order to facilitate their retrieval. Further, subject access is more significant and interesting than

format. This finding corresponds with Hirons & Graham (1998) who explained that the ultimate goals of providing access, facilitating searching, and sharing information remain the same even there are changes in formats, technology, and user expectations..On the contrary, certain memory institutions argue against the idea that cataloging photographs in any format is the same. For instance, technical data on the digital format is more considered when documenting an image.

- **The Availability of Guidelines for Cataloging Digital Photographic Materials**

In their workplace, most of the responding memory institutions have guidelines and documentation available in print format rather than digital format. It can be assumed that available guidelines and documentations from leading organizations are publicized in print format. Thus the printed guidelines and documentations are acquired to the responding memory institutions. Also, print format is probably convenient to read and consult. Further, the findings reflect the respondents' awareness of the importance of having guidelines and documentation by stating that they have a plan to come up with guidelines soon. The guidelines enable staff to cope with multiple cataloging practices by using the same standard. As a result, metadata is created consistently (Park, 2009).

- **Metadata Creators of Digital Photographic Collections**

Archivists are the major group creating metadata of digital photographic collections according to responses by participating memory institutions. Although the findings might be different if there were more responses from the library and museum communities, this issue is discussed based on the collected data. It can be assumed, at least, that archivists play an increasingly important role in information organization. This finding should be called to the attention of library schools and encourage them to develop cataloging and classification courses for future practitioners in library and information science field, not focusing only on librarians and also to relevant organizations to provide training courses.

Considering each responding institution type, the findings can reflect their own traditional principles. Catalogers are mostly reported to be metadata creators for libraries, while archivists are selected by archive community respondents. For museum respondents, curators and archivists are both chosen frequently to be metadata creators. Apart from information professionals, it can be assumed that cataloging photographic materials needs

the assistance of relevant people in other domains such as photographers, historians, and the owners of the photographs. Betz (1982) explains that photographic materials are unique and lack explicit information compared to books. In addition, these materials often have little or no text. Extracting, interpreting and transcribing as much information as possible from the content and context of photographs is needed when cataloging. Moreover, secondary sources are also necessary to provide users with a complete description as possible.

- **Chief Sources of Information for Cataloging Digital Photographic Items**

The material itself or the packaging is most often chosen as the chief source of information for cataloging digital photographic materials by respondents. This can be explained by the fact that some information is embedded into a digital format, especially technical data. Besides, the physical nature and image content can be translated and interpreted into a verbal description by looking at the material itself and its packaging as a basis. However, the respondents state that they also supply information from secondary sources such as reference resources, subject specialists, or image donors. This finding is correspondent with the section "Chief Source of Information" in *Graphic Materials: Rules for Describing Original Items and Historical Collections*, compiled by Elizabeth W. Betz (1982, p. 9).

- **Awareness of the Importance of Metadata and Metadata Type for Organizing Digital Photographic Collections**

Overall, responding memory institutions are aware that metadata is very important for digitizing projects. However, archive respondents consider metadata to be somewhat important whereas library and museum respondents agree that metadata is very important.

Responding memory institutions think that every metadata type is somewhat important; the descriptive metadata category receives the highest mean importance rating. This can reflect the nature of memory institutions tasks which are collecting, organizing, and providing access to the resources. Then information discovery is the most important. Further, descriptive metadata is rated as very important only by library respondents. It can be assumed that library community respondents are more concerned about the important role of descriptive metadata than other metadata types and other communities.

- **Metadata Schemes for Digital Photographic Collections**

Standard for Fotokatalogisering is the most adopted metadata scheme for digital photographic collections. Refer to table 4.2.8, it may indicate the reasons why most responding memory institutions have decided to choose this standard: 1) it is supported by leading organizations, 2) it is widely used, and 3) it is simple and easy to use. Even though this standard is not an international standard like the Dublin Core Metadata Element Set, it has been developed as a national cataloging standard for photographic collections. Therefore, it is appropriate to locate this particular information resource in its specific context. As a national standard, it may be indicated that it is widely accepted among memory institutions in Norway. Consequently, it can increase interoperability among communities, support knowledge sharing among standards users, as well as obtain help from leading organizations and memory institutions in order to solve obstacles and improve cataloging practices. A survey of museums, archives, and libraries in the UK (Birdsey, 2000) also found that the majority of organizations used national standards such as the Museum Documentation Association (MDA) standards and SPECTRUM instead of international standards.

- **Subject Cataloging Standards for Digital Photographic Collections**

Instead of assigning controlled vocabularies, most responding memory institutions use free keywords for providing subject access to digital photographic collections. This is different from the principle of indexing as Chopey (2005, p.272) indicated that "The most fundamental principle in constructing a subject index is to use a controlled vocabulary." Controlled vocabulary can solve problems that arise from using natural language, in terms of preciseness, consistency, homonyms, and synonyms (Jörgensen, 2003, p.71).

However, the use of free-text descriptions or keywords is another choice for providing subject access to digital photographic collections (Jörgensen, 2003). Further, free keywords can complement the weakness of controlled vocabularies, which provide up-to-date terms not included in standards and which are more familiar to users. However, it will be more helpful if institutions can provide both controlled vocabularies and keywords (Rettig, Shu, & Level, 2008).

Although the trend of user empowerment is increasing, as of now only a few responding institutions allow users to tag their digital photographic collections. However, some respondents are planning to provide for this soon.

- **Core Elements for Digital Photographic Materials**

The findings also reflect the responding memory institutions' perspectives on the standard elements of the *Standard for Fotokatalogisering*. The standard has determined that 26 core elements for describing photographic materials are categorized into four groups: 1) "identification and provenance (Identifikasjon og Proveniens)", 2) "motive and content information (Motiv- og Innholdsinformasjon)", 3) "copies and material information (Eksemplar- og Materialinformasjon)", and 4) "administrative information (Administrativ Informasjon)".

The most important elements in their perspectives are agreement with the determined mandatory standard elements. The mandatory standard elements in the categories of "identification and provenance (Identifikasjon og Proveniens)" and "motive and content information (Motiv- og Innholdsinformasjon)" are chosen as the most important elements by respondents. Conversely, some mandatory standard fields in the categories of "copies and material information (Eksemplar- og Materialinformasjon)" and "administrative information (Administrativ Informasjon)" are different from the respondents' views.

In detail, the mandatory standard elements under the category of "copies and material information (Eksemplar- og Materialinformasjon)" are "material description (Materialbeskrivelse)" and "rank (Plassering)". The results reveal that respondents believe that the element "condition (Tilstand)" should also be a mandatory standard element.

For the category of "administrative information (Administrativ Informasjon)", "policy/copyright (Klausul/opphavsrett)", "registrar and cataloging date (Registrator og katalogdato)" and "imaging (Bildegjengivelse)" are mandatory elements. However, based on the findings, it is suggested that the element "accession/growth (Aksesjon/tilvekst)" and "history (Historikk)" should be mandatory elements too.

4.4.3 Section III: Problems and Opinion on Cataloging Digital Photographic Collections

The top three problems regarding cataloging digital photographic collections faced by responding memory institutions are insufficient budget, not enough existing data on the materials, and a demand for specialized knowledge and skills.

Turning to their opinion on factors affecting cataloging practices for digital photographs, user needs, policy on digital photographic collection development, and technology are the most cited factors.

The results of the questions on problems and relevant factors for cataloging practices of digital photographic collections reflect what respondents must face and their concerns about receiving help and support from relevant organizations.

Results of the question on support needed and recommendations are in accordance with the results on problems and factors. They can be divided into four categories based on respondents' opinions for discussion.

First, the respondents recognize the importance of knowledge and experience sharing. As mentioned above, they have considerable work experience with organizing digital photographic collections. Consequently, communication among institutions with similar tasks and problems can profit from sharing knowledge and skills. In addition, relevant organizations can use this finding to design a training plan and arrange workshops, seminars, and other events. This can address the problem that some institutions lack specialized knowledge and skills.

Secondly, the availability and use of standards is a significant issue in the opinions of the respondents. These standards should be more promoted for use. National subject heading standards should be designed and employed for digital photographic collections. Additionally, the standards should be easy to use, clear, and concise. They can improve the effectiveness of newly designed cataloging systems and practices as well as information retrieval.

Another issue is the cataloging database system itself. The respondents recommend that cataloging database systems should be appropriately designed to particular photographic

collections. In addition, the systems should provide a function to allow the automatic transfer of the cataloging data to any format.

Finally, financial support from relevant organizations should be given continuously and should be adequate to administer their reasonability.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

Chapter 5 attempts to answer the research questions. Additionally, some implications of the research are presented. Finally, recommendations for further research are provided.

5.1 The Research Questions

The purpose of this research is to explore the metadata practices for digital photographic collections in archives, libraries, and museums in Norway. The research describes the general understanding of the information organization of digital photographic collections by memory institutions in Norway. To accomplish this aim, two main research questions were established which are discussed individually.

Research Question 1

What is the current state of metadata practices for digital photographic collections in archives, libraries, and museums in Norway?

This research question consists of three sub-questions. Each sub-question is answered individually.

Research sub-question 1.1

What is the general current state of metadata practices for digital photographic collections in archives, libraries, and museums in Norway?

This section reports the current state of metadata practices for digital photographic collections from the point of view of the respondents on the availability of guidelines in the workplace, metadata creators, chief sources of information when cataloging these materials, and metadata awareness.

Most of the responding memory institutions have guidelines available at their workplaces in print format more often than digital format. Although some responding institutions do not have them now, they report having a plan to acquire them soon. In their opinion, cataloging digital photographic materials are similar to photographs in other formats. That is because the purposes of cataloging, in their opinion, remain the same no matter which

format photographs are in. However, some responding institutions believe that the technical data for digital formats should be described differently.

When cataloging digital photographic materials, the material itself is most often reported by the respondents to be the chief source of information. In addition to the material itself, the respondents reported that secondary sources such as reference resources, subject specialists, and the image owners can also supply information. This can be explained by the fact that the cataloging of photographs requires information from other resources to transcribe and interpret them sensible to users. In addition, little information is probably provided on the actual materials. Archivists are most often reported as the metadata creators of digital photographic collections.

In general, metadata is very important for organizing digital collections in the perspective of the respondents. In the eyes of responding library institutions, descriptive metadata is ranked as very important. Even though every metadata type is rated as somewhat important from the archive and museum communities, descriptive metadata still receives the highest score. It can be assumed that every memory institution type keeps an eye on how to improve and facilitate resource discovery for their users. However, based on the findings, library community respondents, more than other communities, believe the role of descriptive metadata is more important than other metadata types.

Research sub-question 1.2

Which standards for descriptive and subject cataloging do archives, libraries, and museums in Norway use for their digital photographic collections?

Standard for Fotokatalogisering is the most adopted metadata scheme for digital photographic collections in responding memory institutions. Support from leading organizations, widely-used standards, and ease of use have an influence on the decision on to adopt this standard. As reported by the respondents, the *Standard for Fotokatalogisering* is not adopted for other digital collections.

For subject cataloging, responding memory institutions assign free keywords more often than using standardized subject heading lists. According to the respondents, there is no available national subject heading standards at this time. However, as stated in *Standard for Fotokatalogisering*, ABM-skrift no.44 (ABM-utvikling, 2008), institutions could use *Outline of Cultural Materials*, *Universell desimalklassifikasjon, Fotoregistrene*, *Thesaurus*

for Graphic Materials II, and *Fylkesfotonettverk Rogalands emneordsliste for fotografi* for indexing photographs. For responding institutions that index with keywords, they do not, for the most part, allow users to assign tags or keywords to their collections yet, although some are planning to allow this soon.

Research sub-question 1.3

To what extent do the mandatory elements of the Standard for Fotokatalogisering (Standard for Cataloging Photographs) agree with the perspectives of the archive, library, and museum communities in Norway?

Turning to the core elements of the *Standard for Fotokatalogisering*, the findings show that most mandatory elements in this standard are in agreement with the respondents' perspectives. On the other hand, some elements in the categories of "copies and material Information" (Eksemplar- og Materialinformasjon) and "administrative information" (Administrativ Informasjon) are different from the respondents' views.

The element "condition" (Tilstand) in "copies and material information" (Eksemplar- og Materialinformasjon) and the elements "accession/growth" (Aksesjon/tilvekst) and "history" (Historikk) in the category of "administrative information" (Administrativ Informasjon) are reported as highly important elements by the respondents. Based on the findings and subject to additional relevant criteria such as user needs, other international standards, or additional best practices, the researcher recommends consideration on whether to declare these above-mentioned elements as mandatory.

Research Question 2

What are the problems and factors regarding cataloging digital photographic collections in archives, libraries, and museums in Norway?

This research question consists of four sub-questions. Each sub-question is answered individually.

Research sub-question 2.1

What are the problems regarding cataloging digital photographic collections in archives, libraries, and museums in Norway?

With relation to problems regarding cataloging digital photographic collections, responding archives, libraries, and museums report that facing an insufficient budget much is the most problematic, with the highest mean. In addition, inadequate existing data on the materials and a high demand for knowledge and skills also greatly challenges them.

Research sub-question 2.2

What factors can affect cataloging practices for digital photographic collections in the future?

Based on the reported respondents' opinions, user needs, policies on digital photographic collection development, and technology are most often indicated as potential factors affecting cataloging digital photographic collections.

In detail, library respondents think that changes in policies on digital photographic collection development, technology, and user needs can affect cataloging practices. For archive respondents, user needs is the most important factor, whereas policy on digital photographic collection development is the most important for museum respondents.

Research sub-question 2.3

To what extent can archives, libraries, and museums in Norway contribute to collaborative digital photographic collection projects?

The majority of responding memory institutions participates in a joint digital photographic collection development project. The findings report their potential contributions to collaborative projects, which can be categorized into two important aspects: knowledge and skills, and resources.

- Knowledge and Skills

As reported by some respondents, they have several years of work experience on cataloging general resources and photographic collections, organizing the collections for specific groups of users and dealing with copyright and privacy issues. The findings indicate that they can contribute these various experiences by sharing their competencies and experiences among other institutions sharing the same goals. Some activities such as holding conferences, workshops, and training courses are suggested by the respondents.

- Resources

Some respondents can contribute other resources such as documentation on extensive and well-organized photographic collections, topic lists, and local database systems for photographic collections.

Research sub-question 2.4

What do archives, libraries, and museums in Norway need in order to improve their metadata practices for digital photographic collections?

As presented in sections 4.3.5 and 4.3.6, the responding memory institutions would like four categories of support from relevant institutions regarding cataloging digital photographic collections.

- Metadata Standards for Digital Photographic Collections

The findings indicate that flexible, clear, and concise standards for descriptive cataloging of photographic materials are required. According to the findings and section "2,5 Klassifikasjon, Emneord og Motivtype" in *Standard for Fotokatalogisering* (ABM-utvikling, 2008, p.10), there are no national standardized subject headings lists and authority lists. There are only lists of motive types available. Consequently, establishing subject cataloging standards should be taken into relevant national organizations' consideration. Apart from developing national standards, the promotion of their use through publications, workshops, and seminars should be also undertaken.

- Regional Center

Some respondents state that regional centers with staff are needed. Center at the regional level can efficiently provide assistance and support concerning digitizing projects, information organization, and other interesting issues. However, in fact, there are already regional centers which are responsible for these tasks. The researcher would like to call the attention of ABM-utvikling and other relevant organizations to consider why the regional centers are unknown and to what extent they should operate more widely and strengthen their services.

- Technology

Export functions of database management systems are required to improve database abilities. Some functions to handle large photographic collections are also needed. Apart from software requirements, the findings indicate that leading relevant organizations should consider providing technological help. Many institutions require this support urgently.

- Budget and Staff

Many of the responding memory institutions report facing budget problems. The respondents explain that financial constraints affect their necessary work in connection with database systems and the employment of more staff.

5.2 Implications of the Research

Based on the above-mentioned key findings, some recommendations are suggested to relevant communities and organizations.

5.2.1 Implications for the Library and Information Practitioner Community

This research helps expand our understanding of metadata practices for digital photographic collection in the context of archive, library, and museum communities in Norway. Even there are statistics on archives, libraries, and museums published by ABM-utvikling, there is still the lack of a comprehensively detailed census of memory institutions holding digital photographic collections in particular libraries and other memory institution types such as government units, newspaper company, broadcasting media companies, or art galleries. Therefore, ABM-utvikling or other relevant organizations may consider collecting and providing statistics and information on digital photographic projects in archives, libraries, and museums as well as other memory institutions. This background information will benefit further research, collaboration, and support.

Moreover, it is also suggested that relevant leading information professional organizations should consider the improvement of the *Standard for Fotokatalogisering* in terms of the mandatory core elements and their flexibility. Further, the use of standards should be

promoted more strongly via publications, training courses, and seminars. In addition to updating the existing standards, subject heading standards should be designed and developed in accordance with the *Standard for Fotokatalogisering*.

Educating involved information professionals about cataloging digital photographic collections and related topics is recommended to the archive, library, and museum domains at the national, regional, and institutional levels.

In addition, relevant organizations should provide opportunities to share knowledge and experiences so that the practitioner community can contact and collaborate with other parties who share common goals for better practices for digital photographic collection projects, and initiate other interesting projects as well.

5.2.2 Implications for Library and Information Science Education

Based on the findings, library and information science (LIS) schools might revise their curriculum, especially cataloging and classification courses, in order to match the changes regarding cataloging practices and standards. In addition, LIS schools might consider playing more significant roles in professional development by collaborating with professional archive, library, and museum domains.

5.3 Further Research Ideas

As survey research can present a snapshot of opinions at a certain time, it may deduce the present situation when the time passes. Additionally, due to limitations regarding the research population and sampling, it is recommended that the same topic should be surveyed again. However, further research will be more interesting if a preliminary search to collect email accounts of memory institutions which engage in digital photographic collections, particularly in libraries, is conducted. As a result, the findings would more accurately represent the current state of metadata practices in the archive, library, and museum communities. Further, follow-up interviews should be administered for more in-depth information from the respondents.

It is also recommended that a further study on the needs of standardized subject heading lists be conducted. The study should investigate opinions from various relevant communities such as practitioners, scholars in library and information science and in other

related areas, and users in order to establish the lists of subject headings for photographic collections.

Moreover, conducting research on the metadata needs of photograph users such as journalists, art historians, or students is another suggestion in order to figure out their photograph seeking behavior. Research projects on photograph users' opinion are increasingly carried out by scholars around the world. However, it was found that such topic, especially in connection to memory institutions' current metadata practices and problems which is the focus of the present study, has been inadequately acknowledged in the context of Norway. Empirical studies into the topic of this kind would enable us to fill the gaps of the ability to effectively organize digital photographs based on memory institution's internal capacity and users' opinion, which would ensure the effectiveness of existing metadata and enable its improvement with user-centered metadata. Furthermore, the use of focus groups or interviews should be employed to observe user patterns and gather in-depth attitudes on metadata and retrieval.

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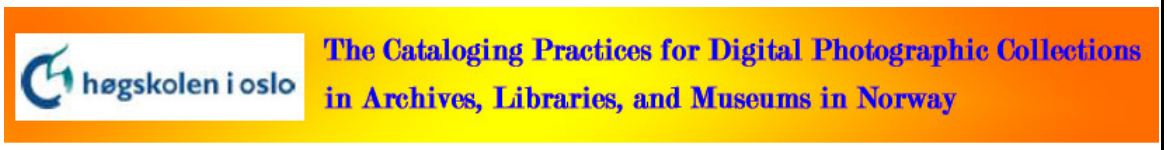
APPENDICES
Appendix I
Online Questionnaire



Cataloging Practices for Digital Photographic Collections

Dear Participants,

My name is Wachiraporn Klungthanaboon. I am currently studying an International Masters degree in Digital Library Learning (http://dill.hio.no) at Oslo University College, Oslo, Norway. This program is under the European Commission's Erasmus Mundus programme. I am conducting research on **THE STUDY OF METADATA PRACTICES FOR DIGITAL PHOTOGRAPHIC COLLECTIONS IN ARCHVIES, LIBRARIES, AND MUSEUMS IN NORWAY**as a partial fulfillment of the program requirements. The purpose of this research is to investigate the current state and problems of metadata practices for digital photographic collections in archives, libraries, and museums in Norway. It is hoped that the findings will contribute to an understanding of the current state of metadata practices for digital photographic collections in Norway. Moreover, the findings may inform and guide relevant organizations to improve and support memory institutions in Norway to organize these valuable digital cultural heritage photographic collections.

Presently I am in the stage of data collection. In order to collect the required data, you are kindly requested to respond the online questionnaire. In case you are not responsible for a digital photographic collection, I kindly request for your assistance to forward this email to the correct person who organizes this collection in your institution. **ALL COLLECTED DATA WILL BE TREATED CONFIDENTIALLY.** (No reference to institutions/respondents will be published.)

The questionnaire will take approximately 25-30 minutes to complete. It will be greatly appreciated if you could complete the questionnaire by **5th May 2010.**

Thank you very much for your contribution and time.

Sincerely yours,

Ms.Wachiraporn Klungthanaboon
International Master in Digital Library Learning (DILL)
Oslo University College
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1) What kind of memory institutions do you work for?

☉ Archive ○ Library ○ Museum

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2) Which cataloging database system do you use for digital photographic collections?

☉ PhotoStation

○ Primus

○ Bibliofil

○ Mikromarc

○ Aleph

○ Asta

○ Other, please specify

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3) How long has your institution cataloged digital photographic collections?

○ less than 1 year ○ 1 – 3 years ○ 4 – 6 years ○ more than 6 years

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4) What was (were) the main reason(s) for digitizing photographs? (Please tick all that apply)

☐ To preserve the originals

☐ To support educational and research activities

☐ To improve accessibility

☐ To increase information sharing

☐ Other, please specify

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5) What are source materials of your digital photographic collections? (Please tick all that apply)

☐ Photographic prints

☐ Film negatives

☐ Glass negatives

☐ Slides

☐ Other, please specify

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6) Is (Are) your digital photographic collection(s) published online?

- ☐ Yes
- ☐ Not now, but have a plan
- ☐ No. Please specify the reasons

7) Do you have other digital collections?

☐ Yes ☐ No ☐ Not applicable

8) Please rate your awareness of the importance of metadata for digital photographic collection development projects

- ☐ Very unimportant
- ☐ Somewhat unimportant
- ☐ Somewhat important
- ☐ Very important

9) The followings describe problems faced in cataloging digital photographic collections. Please identify the rating scale of each problem.

	Never	Little	Much	A great deal
Hard to decide which metadata standards to use (descriptive cataloging and subject cataloging)	☐	☐	☐	☐
Several confusing metadata concepts: metadata types, mapping, crosswalk etc.	☐	☐	☐	☐
Difficult to determine which metadata elements are useful for users and staff	☐	☐	☐	☐
Not enough existing data on the materials.	☐	☐	☐	☐
Demand high knowledge and skills	☐	☐	☐	☐
Not enough available documentations at workplace	☐	☐	☐	☐
Documentations cannot ensure the consistency of cataloging	☐	☐	☐	☐
Insufficient budget	☐	☐	☐	☐

10) If you have other problems not mentioned above, please state them. (*Answer in Norwegian is accepted)**

11) Does your institution have in place guidelines for cataloging the digital photographic collections?

- ☐ Yes, in print format.
- ☐ Yes, published online.
- ☐ No
- ☐ Not now, but plan to do it soon.

---

12) Who catalogs the items in the collection? (Please tick all that apply)

- ☐ Cataloger
- ☐ Archivist
- ☐ Curator
- ☐ IT staff
- ☐ Other, please specify

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13) What is (are) the chief source(s) of information for cataloging the digital photographic items? (Please tick all that apply)

- ☐ Material itself or the packaging
- ☐ Researchers
- ☐ Doing fieldworks
- ☐ Other, please specify

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14) Which metadata scheme is used for your digital photographic collections? (Please tick all that apply)

- ☐ MARC
- ☐ Dublin Core Metadata Element Set (DCMEs)
- ☐ Encoded Archival Description (EAD)
- ☐ Visual Resources Association (VRA) Core
- ☐ Categories for the Description of Works of Art (CDWA)
- ☐ Standard for fotokatalogisering
- ☐ Other, please specify

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15) Why the above-mentioned scheme is chosen? (Please tick all that apply)

- ☐ It is flexible and extensible
- ☐ It is simple and easy to use
- ☐ It supports information sharing
- ☐ It is widely used
- ☐ It is supported by leading organizations
- ☐ Previous experiences
- ☐ Other, please specify

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16) Is that metadata scheme used for other digital collections? (Please skip this question if you don't have other digital collections.)

☐ Yes ☐ No ☐ Not applicable

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17) Which standard(s) of subject heading lists do you use? (Please tick all that apply)

- ☐ Library of Congress Subject Heading
- ☐ Ordnøkkelen – thesaurus for kulturminnevern
- ☐ Art & Architecture Thesaurus
- ☐ Other, please specify
- ☐ Free keywords - - no controlled vocabularies

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18) Is that standard of subject heading lists used for other digital collections? (Please skip this question if you don't have other digital collection.)

☐ Yes ☐ No ☐ Not applicable

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19) Does your institution allow users to tag the digital photographic records?

- ☐ Yes
- ☐ Not now, but plan to do it soon
- ☐ No. Why?

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20) Which element(s) is (are) the most important for IDENTIFIKASJON OG PROVENIENS? (Please tick all that apply)

- ☐ Identifikator
- ☐ Alternativ identifikator
- ☐ Tittel
- ☐ Alternativ tittel
- ☐ Hierarkinivå/ registreringsnivå
- ☐ Relasjoner
- ☐ Navnknyttet til opphav, eierskap og forvaltning
- ☐ Other, please specify

---

21) Which element (s) is (are) the most important for MOTIV- OG INNHOLDSINFORMASJON? (Please tick all that apply)

- ☐ Motiv- og innholdsbeskrivelse
- ☐ Navn knyttet til motiv/innhold
- ☐ Stedsnavn
- ☐ Motivdato
- ☐ Motivtype
- ☐ Emneord
- ☐ Klassifikasjon
- ☐ Utfyllende informasjon
- ☐ Other, please specify

---

22) Which element (s) is (are) the most important for EKSEMPLAR- OG MATERIALINFORMASJON? (Please tick all that apply)

- ☐ Produksjonsdato
- ☐ Materialbeskrivelse
- ☐ Mål
- ☐ Tilstand
- ☐ Plassering
- ☐ Other, please specify

---

23) Which element (s) is (are) the most important for ADMINISTRATIV INFORMASJON? (Please tick all that apply)

- ☐ Klausul / opphavsrett
- ☐ Aksesjon/tilvekst
- ☐ Historikk
- ☐ Andre administrative opplysninger
- ☐ Registrator og katalogdato
- ☐ Bildegjengivelse
- ☐ Other, please specify

24) Please rate how important each metadata type is for organizing digital photographic collections

	Very unimportant	Somewhat unimportant	Somewhat important	Very important
Descriptive metadata (To identify and describe collections and resources)	☐	☐	☐	☐
Administrative metadata (To help manage a resource e.g. acquitstion information, rigths, reproduction, location)	☐	☐	☐	☐
Structural metadata (To describe how an item is structured e.g. format, hardware and software, authentification data)	☐	☐	☐	☐

25) Please state some reasons (*Answer in Norwegian is accepted)**

26) In your opinion, cataloging photographs in digital format is SIMILAR to or DIFFERENT from photographs in other formats?

- ☐ Similar to photographs in other formats
- ☐ Different from photographs in other formats

27) Please state some reasons (*Answer in Norwegian is accepted)**

28) Does your institution participate in a joint digital photographic collection development project with other institutions in Norway?

☐ Yes ☐ No ☐ Not applicable

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29) What can your institution contribute to collaborative digital photographic collection projects in terms of cataloging and classification? (*Answer in Norwegian is accepted)**

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30) In your opinion, which factors will influence your cataloging practices for digital photographic collections in the near future? (Please tick all that apply)

- ☐ Administrative infrastructure changes in your institution
- ☐ Policy on digital photographic collection development
- ☐ Descriptive and subject cataloging standards
- ☐ The increasing numbers of photographs
- ☐ Ongoing knowledge and skills
- ☐ Technology
- ☐ Users needs
- ☐ Participatng in a joint program
- ☐ Staff commitment
- ☐ Other, please specify

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31) What kinds of support should relevant organizations (e.g. ABM-utvikling) give you to improve the cataloging practices for digital photographic collections? (*Answer in Norwegian is accepted)**

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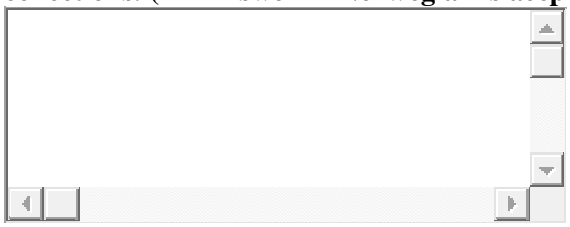
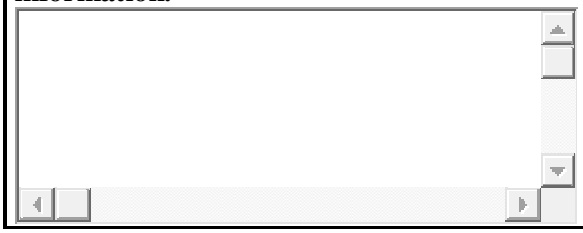
32) Please indicate comments on and recommendations for cataloging digital photographic collections. (*Answer in Norwegian is accpeted)**



33) Thank you very much for your kind contribution. To gain more comprehensive understanding, we may contact you for short interview. Please kindly provide your contact information.



Appendix 2

The Reasons why Cataloging Digital Photographs is Similar or Different from Photographs in other Formats

Question: ***In your opinion, cataloging photographs in digital format is SIMILAR to or DIFFERENT from photographs in other formats? Please state some reasons.***

- **Similar to cataloging photographs in other formats**

Institution #26 – Archive	Does not really the big fundamental difference between the 120-format photographs, 35 mm, glass plates, digital images in jpg, raw, APS, etc. - everything is taken by photographers but only the technology and the medium is different, not the content or meaning of the content. This difference is important in relation to the physical preservation.
Institution #13 – Library	Subject headings, names, years, places are the same information asked for information, digital or not
Institution #18 - Library	No. Either - or. Main content cataloging information is the same, in digital formats file info is necessary, in other formats factual information on the object is required
Institution #22 – Library	It is similar as it is still an image that has been taken by somebody and that shows something on a specific time and place. The difference is only the carrier.
Institution #3 – Museum	The subject is most important in the cataloging process, not the type specimen
Institution #9 - Museum	Cataloging photographs is in many ways similar. But the cataloging has changes the past years. Before the catalog information was only for internal use by the museum staff. Today we digitize photos and more and more of the catalog data are on Internet and we gradually change the catalog more towards the Internet. The users on Internet often ask for different things and use other “emneord” (keywords) tags than the museum staff.
Institution #19 – Museum	The reason for cataloging photographs is to be able to retrieve them in a simple way, whatever format.

Institution #27 – Museum	You need the same information for cataloging and retrieval. For digital photo will be placing an electronic link as opposed to analog photos physical position
Institution #29 – Museum	Same in most cases, but makes retrieval easier and it saves the original materials.
Institution #44 – Museum	The subject is most interesting. Copy type means less.

- **Different from cataloging photographs in other formats**

Institution #33 – Museum	Mainly similar to cataloging analog formats when registering information in Primus. However, digitally created photos will not need to be scanned. For this reason, there is a difference in "eksemplar-/materialinfo" (pixles and not centimeters) and in "administrativ info" (e.g. authentication/clause) - which digitally created photography is "the original" as one can make "hundreds" of copies of a photo file, and even alter a file almost without trace?
Institution #40 – Museum	Original photographs often provide a very different and necessary background for information – technical (teknikk), material (material), inscriptions (påskrifter), motive details (motivdetaljer), condition (tilstand)"
Institution #45 – Museum	We tend to forget describing the format and type of digital files, in this it is different from working with original photographs in other formats. (It should be the same really, but so far it is not so in my experience.)