

**DEMATERIALIZATION OF A PHOTOGRAPHIC COLLECTION AT
THE CONCRETE INSTITUTE'S INFORMATION CENTRE**

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PLAGIARISM DECLARATION

I understand the meaning of plagiarism and declare that all the work in the document is my own.

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Abstract

The Concrete Institute's information centre houses special collections and information about concrete and various aspects of concrete technology, including photographs that need to be managed effectively for retrieval purposes. The photographic collection has to be recorded and preserved according to relevant standards to ensure longevity and long term access. Management of photographic collections comes with its unique problems.

The purpose of this study is to improve the state of the photographic collection by organising it for easy retrieval, allocating metadata and preserving it for future use. This study employed the action research method to study problems of the photographic collection at the institute. The action research method aims to find solutions to problems that are experienced by people in their everyday lives. Data was collected from a sample drawn using purposive sampling from the target population of information specialists and professionals. Data collection from information professionals was facilitated through an online questionnaire and three information specialists were interviewed. The study has indicated the importance of dematerialisation and allocating metadata to photographs to help identify and enhance accessibility of information resources. The results show that dematerialising the photographs will ease the retrieval process and assist information professionals to gain a greater insight of the material in their collection. Collections that are easily accessible are usable and fulfil their purpose to information users. In conclusion, a summarised overview of the study is presented in findings and recommendations regarding the management of photographic collections for effective retrieval.

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List of acronyms

ICTs	Information and Communication Technologies
JPEG	Joint Photographic Experts Group
NISO	National Information Standards Organisation
TIFF	Tagged Image File Format

Chapter 1: Introduction

1.1 Introduction

Information centres are known collectors of information resources in their respective formats; therefore, it is their responsibility to ensure that the collections in their custody are discoverable and preserved for future use. According to Briët (1951, quoted by Navarrete & Owen, 2011: 13), “information resources are intended to inform; they can be in any physical or digital format, intended to represent, reconstruct or demonstrate a physical or conceptual phenomenon”.

According to Shepherd (2004: 1), the current age is considered the “digital era as it is characterised by technology which increases the speed and breadth of knowledge turnover within the economy and society”. In this era, information-keeping in institutions is changing as an increasing amount of information is found online. Therefore, it is in the best interests of institutions to preserve information that is easily accessible and functional to the target audience. Wilson, Kellerman and Corey (2013: 4) point out that ‘information society’ is enabled by information and communication technologies (ICTs). Technology facilitates the creation, management, control and distribution of information by society. They further explain that the definition of “information society favoured by sociologist Frank Webster states that theoretical knowledge/information is at the core of how we conduct ourselves these days” (Wilson, Kellerman & Corey, 2013: 17). In today’s information society, institutions are looking for new ways to improve how they should organise information as well as the processes of information retrieval. As the world develops and introduces new technology, the desire for easily accessible digital collections is growing rapidly.

The Concrete Institute’s Information Centre houses special collections of information on the subject of concrete and various aspects of concrete technology. This collection has to be recorded and preserved according to relevant standards to ensure longevity and access for future generations. This collection includes digital and printed photographs on the works of concrete. Ingledeew (2005) points out that photographs are unique as they speak a universal language and they could be used to help in explaining a particular problem. Due to their fragile nature, photographs require specialised storage and preservation methods (Deshpande & Panage, 2004:289). Although the collection at The Concrete Institute is in good condition, its only shortcoming is that it is a hidden collection with no easy access and it is not linked to other collections held by the institute. The digital photographs are saved on a computer hard

drive without any finding aids such as descriptions of the photographs. The printed photographs are filed in folders and stored in archival boxes and albums. The collection would serve a good purpose if it were identified and documented properly for easy access to the information users of the institute. A photographic collection can only succeed in its objective if the photographs are properly stored, catalogued and easily retrieved (Pretorius, 2001: 1). Dematerialisation of information offers a potential solution as it provides a clear and transparent process for problems associated with existing documents in their respective formats. It allows processes to be implemented in bulk and in large volume of content. Avila, Teixeira and Almeida (2015: 640) point out that “dematerialisation aims at eliminating inefficiencies of the information resource associated with maintenance and retrieval of information in that format.”

The Concrete Institute is in the process of developing a knowledge management strategy to preserve and foster information sharing within the organisation. The collaborative nature of documenting the photographic collection will elevate the role of knowledge management within the institute, as the staff will be exchanging and transferring knowledge. Knowledge management aims to maximise the value of organisations as employees possess institutional knowledge. The loss of one employee may result in a loss of valuable information if the information is not transferred into a legacy record. Standard digital curation lifecycles integrate with knowledge management and emphasise the need for creating content for the purpose of use and reuse (Beagrie, 2006:3). To prevent the loss of institutional knowledge, organisations should employ effective ways to capture knowledge and transfer methods before experts leave (Mura, 2016: 22). The knowledge that the concrete technologists have will be shared and used to create an informative collection that will be preserved for future generations.

A strategy for dematerialisation of analogue photographs and their surrogates through digitisation will be developed based on the ability of the organisation to maintain the initiative at hand. The first step in dealing with this issue is to survey the collection, understand where it originates, its nature, format, possible significance and the use thereof. The dematerialisation initiative is important for the institute as the process will make an ‘unknown’ collection of photographs accessible, thereby adding value to the collection. Collections that are hidden take up resources and offer no benefits; instead, they pose problems for librarians as they cannot be easily accessed and preserved.

The *Framework of Guidance for Building Good Digital Collections* (NISO, 2007) states as one of its principles that “a good collection is broadly available and avoids unnecessary

impediments to use” (NISO, 2007: 11). This principle includes the following three elements: “availability, usability and accessibility”. Availability means that the collection is accessible and usable on demand, implying that collections should be accessible through various avenues, using applicable technologies to access the required information. “Availability does not require that the use of all materials be free and unrestricted; charging for use and limiting access may be appropriate and necessary in some circumstances” (NISO Framework Working Group, 2007: 11). Collections should be “as widely available as possible within any required constraints” (NISO Framework Working Group, 2007: 11), and one of the information centre’s mandates is to collect and disseminate information to users. Their platforms for accessing information have to be usable. “Usability refers to the ease of use” (NISO Framework Working Group, 2007: 11) to determine “how many potential users will be capable of using technology and how many will find it a barrier” (NISO Framework Working Group, 2007: 11), while accessibility refers to the forms of search that provide access to the collection, as well as to the principle that metadata and digital object displays should be tested against various browsers to ensure accessibility.

1.2 Background to this study

The Concrete Institute was established in 1938 as an organisation to promote the use of Portland cement and concrete in South Africa. The main objective of the institute is to promote the interests and the general advancement of Portland cement and concrete construction industries as a whole. The institute facilitates the sharing of industry knowledge, which is sourced from the participation in concrete and construction developments in South Africa and abroad. In addition, the institute collects and publicises information that promotes the use of cement and concrete, as well as advising the public on all matters relating to the use of cement, the sustainability and advantages of concrete. In pursuit of its overall objective, the institute established its Information Centre in 1957. Since its establishment, the Information Centre has grown from a small office collection to become one of the most extensive sources of information on cement and concrete in Southern Africa. In the early years of the Information Centre’s existence, the stock of information apparently consisted mainly of collections belonging to individual engineers. The establishment of the Information Centre has helped in collecting, storing, sharing knowledge and information about the subject of concrete for future generations.

Concrete is defined as an “engineering material that simulates the properties of rock, being a combination of particles closely bound together. In its simplest form, concrete is a mixture of

cement, water and aggregates in which the cement and water have combined to bind the aggregate particles together to form a monolithic whole” (Illston & Domone, 2001: 91).

Concrete is the most widely used construction material in the world and possess many unique qualities that benefit the owner, developer and the designer. Concrete can be of any colour, assume any shape and can be designed to meet any strength. What makes concrete special is its flexibility. “Whether we are aware of it or not, concrete is all around us, in our homes, we live on concrete floors and between walls that stand on concrete foundations; we walk on concrete paving, work in concrete buildings and ride on concrete roads. We cross rivers and freeways on bridges built of concrete; the water we drink is collected in concrete dams and stored in concrete reservoirs” (Owens, 2013: 1).

Concrete has been part of civilisation for over 7000 years. The oldest example dates back from about 5600 BC, which consisted of a hut floor in the former Yugoslavia. Concrete was manufactured and used by the ancient Egyptians, which led to scientists believing that the pyramids were made from concrete. However, there are mixed opinions about how and where concrete was first used. Egyptian pyramids have been favoured objects for scientists as they were built about 4500 years ago (Jahren, 2011: 28).

Concrete offers longevity and ease of construction, making it the most economical choice for engineering structures. For South Africa, concrete is a low-impact, environmentally sound material and it is the cornerstone for building construction and infrastructure that can put our society on the road to a sustainable future. The Concrete Institute’s mandate is to ensure the appropriate use of concrete and to promote its use (Cement & Concrete Institute, 2009).

1.3 Research problem

Over many years, The Concrete Institute has built up a collection of photographs that illustrated the equipment and methods of concrete construction. Information about concrete is of technical nature; therefore physical proof of the subject is needed for research to be carried out. Researchers need to inspect and experiment with concrete-related problems to reach their conclusions. Photographic proof of buildings and construction sites has to be collected in order to explain problems associated with the works of concrete. The photographs may also be used for educational and skills development purposes.

The Concrete Institute is faced with the challenge of managing a collection of photographs that was never catalogued for easy retrieval. A photographic collection exists for a certain purpose

and in order to effectively exploit this purpose, photographs need to be effectively recorded and managed. The key to the collection is in its arrangement.

The information specialists at The Concrete Institute often receive enquiries for photographs to illustrate talks, reports and published articles. Since the collection is not properly organised, finding an appropriate photograph is an arduous task for the information specialists. The photographic collection has to be organised and managed effectively to ensure that they are retrieved in a timely manner. Cataloguing of materials is the most crucial aspect of any collection (Adedibu et al., 2012: 314). According to Lee (2001: 103-4, quoted by Lopatin 2006: 280), without a searchable catalogue, users will struggle to find items they are seeking in the collection. Allocating good descriptions to photographs is important, not only to access the photographs, but also to represent the structure, creator, format and technical information of the photographs (Lopatin, 2006: 280).

This study aims to improve the state of the photographic collection by organising the collection for easy retrieval, allocating metadata and preserving it for future use.

1.4 Objectives of the study

This research has the following objectives:

- To determine how the photographic collection can be digitally captured and enhanced for easy retrieval.
- To determine the scope of metadata to be considered.
- To determine how the principles of digitisation may be applied in practice at The Concrete Institute.

1.5 Research questions

The study was guided by the major question:

How may the collection of photographs at The Concrete Institute be optimised for effective retrieval?

Specific research questions were defined to assist in answering the major question:

1. How is the photographic collection of the institute currently organised?
2. What is the understanding among staff members of the benefits of having digitised photographic collection?

3. What are the best practices and standards that should be used for digitising a photographic collection?
4. What measures will be used to record and help make the collection informative and accessible; i.e. what would constitute “effective” retrieval?

1.6 Significance of the study

This research study intends to serve as an important contribution towards efforts aimed at dematerialising the photographic collection housed at The Concrete Institute’s Information Centre for effective retrieval. As mentioned earlier, the photographs are stored on a computer hard drive; they are not easily accessible since they are not catalogued, resulting in the locating of photographs being time-consuming. The main objective of this research is to determine what the best management practices would be for the collection. Photographic collections can be powerful information sources if they are integrated with the textual information in collections.

Every institution’s collection and context is unique; the management of collections will require consideration of the institution’s needs and their client base. The collection of photographs has to be maintained and organised in such a way that photographs may be readily extracted. The dematerialisation of a photographic collection at The Concrete Institute will assist in adding value to the collection and to make it known.

This study will provide The Concrete Institute with benefits of having an accessible collection of photographs for better use and preservation thereof. Organisations with similar problems relating to photographic collections might also find the guidelines in this study useful.

1.7 Definitions of useful terms

1.7.1 Dematerialisation

Van Campenhout et al. (2013:4) define *dematerialisation* as an “action which occurs when an artefact from the physical environment is incorporated into the digital world.” The artefact breaks loose from its physical limitations; its content is liberated and becomes intangible, dynamic and transient. Its content reaches limitless availability.

1.7.2 Digitisation

Digitisation is defined as “the process of creating digital files by scanning or otherwise converting analogue materials. The resulting digital copy would then be classed as digital material and be subjected to the same broad challenges involved in preserving access to it, as born digital materials” (Digital Preservation Handbook, 2015).

1.7.3 Hidden collection

Hidden collection refers to “materials that have not been entered into an online catalogue. They are also unprocessed information sources” (Yakel, 2005: 95).

1.7.4 Preservation

Preservation is defined as an archiving activity in which information materials are “maintained over time so that they can still be accessed and understood through successive change and obsolescence of technologies” (Yakel, 2007: 338).

1.7.5 Curation

Sabharwal (2015: 13) cites Lord and Macdonald (2003: n.p) in referring to curation as “the activity of, managing and promoting the use of data, from its point of creation, to ensure it is fit for contemporary purpose, and available for discovery and re-use.”

1.8 Research methodology

This study employed a qualitative research method, which studies phenomena within the social and cultural context in which they occur. A qualitative research method explores the processes that underlie human behaviour using exploratory techniques such as interviews, surveys, case studies and other relatively personal techniques (Van Zyl, 2014: 213).

Creswell (1998) defines qualitative research as an “inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem.” The researcher builds a complex, holistic picture, analyses words, reports detailed views of informants, and conducts the study in a natural setting (Creswell, 1998: 15). Qualitative research methods allow researchers to collect data in the field where participants experience the problem under study. The ability to gather information face-to-face; gathering of multiple forms of data, such as interviews, observations and documents is the major characteristic of qualitative research (Creswell, 2009: 175).

The action research method was selected to study the problems of the photographic collection at The Concrete Institute’s Information Centre. This research method was chosen as it allows participatory research and enables people to find solutions to problems they confront in their everyday lives (Stringer, 2014). The major attribute in action research is the extent to which the participant has an effect on the problem being studied. The research method is designed to reveal solutions to issues and problems experienced in special situations and to provide means for organisations to increase the effectiveness of their work (Stringer, 2014: 1). The staff at the

institute participated in the research and this helped to reveal local knowledge that might otherwise be hidden. According to Elliot (2011: 11), involving local people as participants in research and planning has proved to enhance effectiveness and save time and money.

Purposive sampling was used to identify the sample for the study. Purposive sampling allows the researcher to decide the purpose they want informants to serve. Being experts in the subject of concrete, the staff at The Concrete Institute participated in the dematerialisation of the photographic collection. Stakeholders from other information institutions that have undergone similar projects have also been considered. The primary data for this study was collected from staff at The Concrete Institute as they have a good understanding of the photographic collection in their custody. Secondary data was collected from colleagues in the library and information sector and the literature published on similar subjects.

1.9 Limitations and delimitations

Every research study has limitations, therefore it is important for the researcher to state the limitations in order to allow other researchers to replicate or expand the study. “Limitations are uncontrollable to the internal validity of the study and are beyond the researcher’s control” (Ellis & Levy, 2009: 332). The major limitation for this research study was the small number of information centres in the construction industry to participate in this study and the short time schedule for the research. The availability of other information centres in the construction industry participating in this study would have assisted the researcher to expand the sample and find if they have similar problems with their photographic collections. However, the data collected from the sample would still be useful for the study.

Simon (2011: n.p) describes delimitations as “characteristics that limit the scope and define boundaries of your study”. Without delimitations, the reader will have difficulties in understanding the limitations of the research (Ellis & Levy, 2009: 332). This study was confined to the photographic collection of The Concrete Institute. The researcher had not examined whether other information centres in the construction industry housed photographic collections.

1.10 Ethical considerations

Ethical procedures are an important part of research, and since this study involves human subjects, the researcher needs to ensure that participants come to no harm as a result of their participation in the research project (De Vos et al., 2011: 128). Lofman et al. (2004: 335)

suggest that a researcher needs to ensure anonymity of the participants and that they should be afforded the right to be able to check the research findings. As indicated in the Appendices, participants of this study were informed about the purpose of the research and they were assured of confidentiality and anonymity. The researcher obtained ethical clearance from the University of Cape Town where the study is registered and, the research study was conducted in accordance to the Research Ethics Policy of the University of Cape Town. Once the ethical clearance was obtained, the research instrument was pre-tested, informed consent was explained and obtained, and the questionnaire was submitted to the professional staff at the Institute. Interviews were conducted with information specialists for the study. Stringer (2014: 89) suggests that research instruments be accompanied by an informed consent form to explain the nature of the research and to inform participants of their rights: the right to refuse to participate, to withdraw from the study at any time, to not answer questions that make them uncomfortable, and a guarantee of confidentiality. According to Creswell (2009: 89), the consent form acknowledges that participants' rights will be protected during data collection.

1.11 The report structure

This research report is divided into five chapters including:

The current chapter, which provides the introduction to the study on the dematerialisation of the photographic collection at The Concrete Institute and also provides the background to the study, research problem, objectives of the study, research questions, significance of the study, research methodology, limitations and delimitations of the study.

Chapter Two contains the literature review and theoretical framework of the study.

Chapter Three covers the research design, methodology used in the study and the data collection procedures.

Chapter Four presents the analysis of data collected and the presentation of findings.

Chapter Five discusses the main findings, the theory that informed the study and summary of the dissertation.

1.12 Summary

The purpose of this study was to determine how to best maximise the collection of photographs housed at The Concrete Institute for effective retrieval. The value of having a visible and accessible photographic collection was discussed in this chapter. This chapter introduced the

context of the study. The background of the subject of concrete was discussed and the objectives of the study were outlined. The following chapter reviews the literature and provides the theoretical framework for the study.

Chapter 2: Literature Review

2.1 Introduction

Literature review is defined as the process of carefully examining literature in order to inform a larger study (Kelley, 2014). This review presents outcomes of studies that have investigated the issue on which the current study is focused. The purpose of a literature review is to establish the importance of the study as well as a benchmark for comparing the results with other findings (Creswell, 2009: 25). This literature review aims to provide insight into the dematerialisation of the photographic collection at The Concrete Institute.

This chapter presents an analysis of concepts and issues related to the handling of photographic collections in various institutions, together with the factors that contribute to the effectiveness of collections in a digital platform. This review is primarily based on materials published between 2000 and the present; however, some earlier works have also been included when relevant to the subject of incorporating photographic collections into the digital world. The literature review focuses on literature that deals with the dematerialisation of photographs, and making collections accessible electronically for easy access and preservation.

2.2 Theoretical framework

Green (2014: 34) defines theoretical frameworks as “organised theories that specify the nature of relationships between variables, with the purpose of understanding a research problem”. The study of dematerialisation of the photographic collection at The Concrete Institute was influenced by interpretive theory, which is defined by Bhattacharya (2012: n.p) as “ontological and epistemological tools used in research concerned with understanding how individuals or groups create meaning in their everyday practices, communications and lived experiences.” According to Creswell (2009:8), interpretive theory makes sense of the phenomena under study and understands the participant’s view of the problem studied. Interpretive theory is underpinned by observation and interpretation of events and it is also concerned with understanding the nature of reality that uses methodologies such as observation and interviews to collect data from participants. Willis (2012, n.p) indicates that the core belief of this theory is that the “reality we know is socially constructed.” Social constructivism deals with how people perceive and understand their world. Williamson (2006: 84) asserts that the key to interpretive theory is to study the phenomena in their natural setting and also points out that the theory allows the researcher to develop a relationship with the phenomena being studied.

In the interpretive theory, the researcher is a participant and observer of the study. Willis (2012) and De Vos et al. (2011) points out that the researcher should attempt to understand the problem studied through interacting with participants. The theory allows the researcher to have a personal lived experience of the phenomena under study and make sense of the situation according to the personal experiences of the participants. The use of interpretive theory in this study will allow the researcher to understand what the participants feel about the problem they are facing and how they make meaning of the problem under study. Photographic collections are unique to each and every institution; therefore the experience of participants is important as they can make sense of their unique situation, thus working towards making sense of their world.

Mai (1998) suggests that research in Information Science should be conducted using an interpretive approach as the theory is based in the humanistic aspect of the field. The humanistic approach entails that the phenomenon studied is focused on the human experience in understanding and interpreting their own situation. According to Babbie and Mouton (2008: 28, quoted by Vosloo, 2014: 307), interpretive theory is also known as the phenomenological approach as its aim is to understand people.

According to Natoli (1982, quoted by Mai, 1998: 235), “the goal of research in a human study is to recreate the human condition of the object of the study in the mind of the reader by utilising the reader’s propensity to both experience and understanding”. Natoli holds that “the Library and Information Studies field should be regarded as a human science, and that human science must use methodologies where interpretation of the object of the study becomes clear for the reader.” (1982, quoted by Mai, 1998: 235) In his research, Koopman (2015, n.p) argues that phenomenology is the potential research method in the field of science education. Koopman’s study “stresses the importance of returning to lived experience to lay bare human consciousness in order to represent lives of participants accurately.”

Buwule (2014) adopted an interpretive approach in his study to analyse Integrated Library Systems at Kyambogo University. The purpose of his study was to explore the drivers and barriers to the adoption of a reliable Integrated Library System. His study concluded that library automation helps staff with their routine operations and to understand the unique challenges faced. The interpretive approach was relevant for this study as it established meaning of the perspectives and experiences of the Kyambogo University staff and librarians in relation to their work.

In his research on the digitisation of the liberation archives of the African National Congress, Netshakuma (2016) explored digitisation strategies that are necessary to make the digitisation process a success. One of his research objectives was to “establish approaches followed by the African National Congress in identifying, repatriating and digitising liberation archives from various countries”. Interpretive research was adopted as the researcher needed to learn the most important aspects of the liberation archives from the participants. The research proves that appropriate strategies are necessary to enable effective digitisation.

Kahsay (2015) indicates that, to make collections accessible to the public since physical sharing may not always be feasible, digitisation appears to be a solution as the collection could be accessible online. The challenge he had in his study was an unsuccessful digitisation programme due to policies and lack of skilled manpower. The objective of his study was to come up with the standard guidelines for a sustainable digitisation initiative to make the collection accessible. In his research findings, he asserts that a digitisation policy should be a priority as this will assist in producing quality work and provide an efficient service to users. The researcher used the interpretive theory to understand the literature on digitisation as well as understanding organisational context from the participants involved in the study.

The incorporation of digital collections into the digital world requires information professionals to be technologically advanced in order to ensure longevity of information resources. The researcher, together with participants of the study, need to familiarise themselves with the literature on managing collections digitally and make sense of their social world. Carstens (2013: 10) points out that digitisation of collections is a complex issue with many variables. He further explains that poor decisions for digitisation may be detrimental to the collection as digital information objects may deteriorate. An example was given of how photographs were scanned using a JPEG file format which is not recommended for archival purposes. Fanning (2006: 13) describes JPEG as a lossy compression format which is best used to transmit photographs on the internet. Lossy compression removes information that is not important to the display of the photograph, it reduces the image to a file size that makes it possible to transfer images across the internet (Spencer, 2010:39). The weakness of using JPEG for archival purposes is that it results in a loss of data with each compression, which lead to image degradation. Information that is lost during compression cannot be recovered (Wiggins et al., 2001:791). Spencer (2010: 44) suggests the use of TIFF for archival purposes as it is a well supported file format. “Service copies may be derived from the master to deliver content over the networked resources” (Spencer, 2010: 38).

Carstens (2013: 10) laments that such mistakes are the result of lack of planning and researching sustainable file formats. He also recommends that advice from experts is necessary to avoid detrimental mistakes while digitising a collection (Carstens, 2013: 10). Pretorius (2001) also indicates that information professionals need to educate themselves with regard to technologies concerning their work environments. This will help in making it possible to manage and solve problems associated with their collections.

The theory selected is used in the discussion as a tool to understand the dematerialisation process of the photographs at The Concrete Institute.

2.3 Similar studies

Sekikome (2016) used a case study approach in his research on developing a strategy for digitising special collections in the Makerere University Library. The objective of the study was to develop an action plan that would lead to digitising a valuable collection to enhance accessibility. Purposive sampling was used to identify institutions which were involved in digitisation projects in the Kampala area. His findings include that proper funding and staff training are required, and that the selection of materials should be based on demand and state of deterioration. He also notes that a digitisation policy should be put in place to guide the digitisation process.

In his research on digitisation guidelines, Kusekwa (2012) interviewed digitisation managers to get an understanding and to come up with guidelines for the University of Zimbabwe's digitisation project. The researcher used the purposive sampling technique as he was able to judge that digitisation managers have the relevant experience to provide information for his study. His findings also indicate the importance of having a policy to guide the process of digitising collections. Training of staff working on digitisation projects is also recommended. It was also found that changes in technology affect digitisation projects; therefore research into strategies to manage technology changes for sustainability is necessary.

2.4 Information resources

Information resources are defined as valuable information generated by human activities, to provide an information service that can be used by users. Although information is valuable to institutions, the lack of structure in the creation, distribution and reception of information will lead to it being useless as it will not serve the purpose for which it is intended. Hirsh (2015: 139) and Wichowski (2009, n.p) both agree that organising information facilitates the ability

to locate information. They “noted that in the rapidly growing information environment, unidentified and unorganised content, however useful it may be, is at risk of being rendered unfindable, and thus obsolete” (Wichowski, 2009, n.p). Laumer et al. (2017) also point out that hidden collections are rather difficult to locate. When organisations neglect their information resources, it leads to employees having to search extensively for information, which is rather time consuming.

Alemneh and Rorisa (2014:18) point out that the digital environment has introduced new user expectations into the current information atmosphere. Research depends on both the availability of diverse resources and their easy and continuous accessibility, therefore it becomes critical to enable knowledge creation and facilitating long-term access to information resources. Information custodians need to be aware of and consider to add value to their information resources by making them more accessible and usable to information users. Sims (2008) views the digital revolution as a wakeup call to information custodians on how they adapt to collection development and accessibility of collections. Digital revolution is a driving force behind the expectations of instantly-available information and limitless accessibility, thus forcing information custodians to reconsider their services and content provision.

2.4.1 Photographs as information resources

Photographs as information resources have the ability to evoke high levels of interest and provide users with a connection to past events. Photographs may convey information even if they are technically faulty and the object can be barely identified (Cohen & Meskin, 2004: 197). Technical information may be better explained in pictures than in text, as photographs have the quality to impart knowledge or communicate information that text cannot (Buckland, 1991: 351). Technical photographs in the construction field assist professionals to explain information about their subject area. According to Bull (2010: 31), photographs communicate meanings to society. Photographic collections in information centres play an important role as the other forms of media do. According to Howells and Negreiros (2012), we live in a visual world. Photographs are used to represent technical information during lectures and in writing of research articles, as they draw attention to reality and tell a story. They are evidence that someone or something definitely existed and they bring the past into the present (Bull, 2010: 15-17).

Technological advancement has sparked an increase in the creation, use and the dissemination of images in a networked environment, but the challenge with photographic information

resources lies with retrieval as images are wordless, whereas effective access is reliant on text (McCay-Peet & Toms, 2009: 2416). Photographic materials also have content other than their illustrative value. It is therefore up to information specialists to reveal that content in order to enhance accessibility and add value to information resources. According to McCay-Peet and Toms (2009: 2416) metadata enhances the retrieval of the photographic material as it can be easily identified by machines and people. Alemneh and Rorisa (2014: 18 - 19) are in agreement as they point out that keyword terms are helpful in assisting users to find what they are seeking. The generating of accurate indexing terms is “fundamental to the discovery, use and re-use of digital resources.”

2.4.2 The meaning of photographs

Visual materials play an important role in the production of knowledge as they speak for themselves (Volpe, 2009). Although visual resources appear to be communicating outside verbal language, applying theories to visual media is important in the analysis of photographs. Bull (2010:33) mentions semiotics as a common technique for interpreting images. Photographs also play an important part in the democratisation of information as they are immediately accessed and convey a complex message in the blink of an eye (Arijs, 2014). Some of the characteristics which photographs offer are “the ability to convincingly record what is in front of the lens and their ability to draw attention to a fragment of reality to tell a story” (Bull, 2010: 11). According to Mai (1998), interpretive theory is more concerned with the participants and how they relate and understand the phenomenon under study. In this study, the participants are the focal point as they use their experience through working with photographs to come up with solutions to enhance its accessibility.

2.4.3 The care of photographs

Roosa (2004: 3) highlights that photographic materials have complex physical and chemical structures that present challenges to information specialists. Printed photographs may deteriorate easily, so special care is needed to preserve them. Clark and Frey (2003: 37-38) point out that digital photographs require special care just like their analogue counterparts as the changes in technology may lead to obsolescence and affect the readability of the photograph. The bulk of information resources today are created digitally, and it should be kept in mind that preserving born-digital objects has to start at the moment they were created. To prevent the loss of photographs, information professionals need to come up with strategies to deal with the problems of longevity in the digital world (Clark & Frey, 2003: 37-38).

2.5 Dematerialisation

Thanks to the internet, a vast amount of information is available in an open and flexible infrastructure, often freely accessible to users. Information technology has transformed the way information is packaged and made it available in a de-structured way and more flexibly for use (Lunghi et al., 2013: 375). Dematerialisation, as defined in Chapter 1, is an “action which occurs when an artefact from the physical environment is incorporated in the digital world.” The artefact breaks loose from its physical limitations; its content is liberated and becomes intangible, dynamic and transient. One of the primary functions of information centres is to collect and organise information resources for users. Information professionals work towards satisfying the needs of information users. The dematerialisation of photographs is aligned with an interpretive theory as it enables the information professionals to present their collection according to the users’ perspective (Mai, 1998: 240).

Van Campenhout et al. (2016: 148) point out the benefits of dematerialised information as being flexibility and limitless availability. Information is able to move freely through devices such as personal computers, tablets, smartphones and e-readers (Van Campenhout et al. 2013: 4). Dematerialisation changes the user’s relationship with the virtual file as images can be viewed on a computer screen and the user can zoom in and out to enhance visibility (Bull, 2010: 26). In interpretive context, dematerialisation of photographs would not have any implications to the users. Hjerpe (1994) quoted by Mai (1998: 237) argues that the “meaning of a document depends on the reader of the document.”

Born-digital objects need to be preserved digitally as technological changes affect their accessibility. Lor (2008: 5) acknowledges that dematerialisation of information is a driving force behind digitisation of information resources in libraries. Digitising a photographic collection will enable the printed photographs to be incorporated to the digital world, thereby unbundling it to enable the photographs to flow freely and reach the limitless availability which dematerialisation offers.

According to interpretive theory, knowledge is gained through social construction and it focuses on “human sense making of the situation encountered” (Klein & Myers, 1999: 69). As technology advances, information professionals are adapting to new ways of providing their services to users. Accessibility of information is important as users prefer convenience. Digitisation of information resources is one way of enhancing access to information resources (Smith, 1999). The digitisation of the photographs will help preserve the printed materials as

handling of the photographs will be reduced. Dematerialisation of the collection will increase accessibility as information users will be able to search through collections online. Online collections offer an advantage of having to zoom in and out, and also to print the photographs while the original is preserved. Arijs (2003) explains that photographs play an important role in the democratisation of information as they are able to convey messages in the glimpse of an eye. Information organisations are forever working on improving their services and production using technology. Dematerialising the photographs at the institute will assist researchers in solving their technical problems and provide them with the opportunity to view the photographs in the size they require. Digital photographs could be manipulated to get details that are not easily seen with the human eye in the printed photograph. Another benefit to the staff of the institute is that they will be able to look for photographs from their offices or conveniently out in the field or when training students, saving them time and the benefit of having multiple access to the collection.

2.6 Digitisation

Information centres embark on dematerialisation of their information resources for accessibility, hence the digitisation of materials to fit into the digital world. Information centres should not only house collections, they should provide better access to their information resources through the new information highway (Singh, 2015: 2). If information resources are to be effective sources of information, they must be easily accessed, and the connected world is increasingly seeking information in virtual spaces. Information centres need to move their content from traditional point portals to the virtual world where information can be accessed anytime, anywhere (Ladd, 2015: 228). Digitisation of information resources differs from dematerialisation in the sense that digitisation is concerned with changing a manual process to become electronic. The process can be done by capturing information into a database or scanning documents into electronic form. For dematerialisation to occur, the electronic document needs to remain in an electronic format throughout the process. Manual and paper based processes are eliminated with dematerialisation (Amadi-Echendu, 2016).

The Digital Preservation Handbook (2015, n.p) defines digitisation as “the process of creating digital files by scanning, or otherwise converting analogue materials. As a result of the digitisation process, the digital copy would then be classed as digital material and subjected to the broad challenges involved in preserving its access for usability.” Arora (2010, n.p) defines digitisation as “the process of converting the content of physical media into a digital format. Analogue information is fed into a computer, and broken down into 0s and 1s, changing its

characteristics from analogue to digital.” Smith (1999, n.p) proclaimed that digitisation of information resources “offers a new chance to shed light on unique collections that were previously inaccessible due to the limitations of analogue formats. Digitisation also enhances the visual quality of faded and illegible documents.” Photographic collections are fragile and pose numerous access and preservation challenges for information centres. These challenges are further complicated if the collections are neglected and become hidden in the collection. Information custodians see digitisation as “the quickest way of unlocking hidden collections.” Digitisation and allocation of metadata to collections ensures the re-unification of collections and therefore provides easy access to information users timeously (Cusworth, et al., 2015: 241).

Adzic (2013: 47) points out that information centres have always been understood to be important centres for creating information. Their success of providing a significant service is based on the opportunities provided by ICT. Digitising of information resources is one of the services that traditional information centres are adapting to as information users are changing the manner in which they search for information. He also agrees with the notion of digitising to preserve and improve access to information resources. The digitising of information resources also benefits information professionals as they will expand their skills and be in a position to improve and build up their knowledge.

2.7 File formats

A file format (in the digital sense) is defined as “the manner in which information is organised, contained in one or more byte streams that can be exchanged between systems. It allows information users to view and access information contained in a data file” (Park & Oh, 2012: 45). It is important for information professionals to familiarise themselves with the different file formats available. This will help in making decisions that ensure preservation and accessibility of the digital information resources and to preserve integrity of the digital images in their collections (Terras, 2012: 62). There are two types of file formats recommended for information resources, an access file format and a preservation format. “Access file formats are used for viewing a document; and the preservation format is suitable for storing a document in an electronic archive for a longer period” (Park & Oh, 2012: 45). The two file formats that have been identified as suitable for digitising photographic collections are the TIFF (Tagged Image File Format) and JPEG (Joint Photographic Experts Group). According to Leggett (2014: 38), TIFF files contain a lot of information and are usually not compressed. It has a lot of appeal when it comes to archiving information resources and it is considered the best choice for digital image storage. JPEG files are considered a good choice for online access (Leggett, 2014: 39).

According to Xie and Matusiak (2016:74), “TIFF is an open and well-documented standard and is regarded as the format of choice for the cultural heritage community”. TIFF files are generally endorsed as the current archival standard for long term storage of high quality image data and are widely supported across operating systems. TIFF files are usually not compressed and owing to the resultant large file size, it is not an appropriate format for displaying images online since they take time to download and some web browsers cannot display TIFF files at all (Leggett, 2014: 31).

JPEG, also known as JPG is a commonly used file format for information resources. The standard was published in 1992 and is generally used on the web and in digital cameras (Xie & Matusiak, 2016: 75). JPEG was specifically created for photographs and can contain up to 16 million colours (Cofield, 2005). JPEG is a good choice for images that will be used online as it has progressive encoding that allows images to load in stages on a web page (Leggett, 2014: 32).

2.8 Metadata

Metadata is a major component for information resources, especially for those resources that will be made available online. One of the most challenging aspects with electronic information is the identification of resources, and information professionals have a duty to describe their online information resources for discoverability. Metadata is the information that helps users to find information objects and help group similar information objects together. Metadata is defined as data about data. It describes information materials so that the resources are identifiable. Metadata serves as a “key to ensuring that resources will survive and continue to be accessible into the future” (NISO, 2004: 1). The traditional catalogue has long been the fundamental tool for information professionals and this remains true in the electronic environment, which has even greater reliance on detailed metadata (Brown, 2013: 155). The creation of descriptive metadata will increase the likelihood that digital content will be discovered easily (NISO Framework Working Group, 2007: 58). Metadata makes accessibility of digital information materials possible as it provides pointers to information which would have been lost in the electronic environment. When digital information lacks proper metadata, it becomes very difficult to locate (Xie & Matusiak, 2016: 129). The value of digital collections is determined by its description and metadata makes the retrieval of digital information possible. One of the most important aspects to consider during the creation of metadata is the consistency of language. Metadata creators should be consistent and clear in the words they use to describe the same type of an information object each time it appears.

2.9 Intellectual property rights

One of the principles that apply to digital collections according to NISO Framework Working Group (2007: n.p) is that “a good collection respects intellectual property rights.” Before the consideration of embarking on making collections digital, it is crucial for information professionals to ensure that they are familiar with the intellectual property rights of their collections. Permission needs to be obtained from copyright holders before making collections available online for use. Intellectual property law deters others from unlawfully copying or taking unfair advantage of the work of another (Bainbridge, 2010: 3-4). Copyright law ensures that the works of authors are protected and offer the notion of fair use (known by the cognate term ‘fair dealing’ in South African law) for educational purposes. Literature shows that as technology provides new avenues of accessing information, the roles of information custodians change as well (Tanner, 2001: 328). Information professionals have long been stewards of information objects in whatever form they come. They serve as gatekeepers in controlling access and dissemination of information. Traditionally, library books are easy to monitor as users know that making a copy of the whole book is not allowed. On the other hand, digital information is networkable and can be easily shared and exchanged globally. Information resources in the electronic environment are relatively easy to manipulate and infringe intellectual property rights. As the internet provides users with limitless access to information resources, information custodians should set restrictions in place to prevent infringement of intellectual property laws and respect the rights of copyright owners (Pistorius, 2006: 48-53). Scholarly information has to adopt the fair use rule as information is not used for profit purposes; rather it is used for educational purposes. Fair use refers to a “reasonable amount of copying information resources for the social benefit and does not threaten the economic interests of the author” (Maxwell & McCain, 1997: 149).

2.10 Digital curation

Digital curation covers tasks such as the creation, appraisal, storage, organising, and preservation of information resources. It “encompasses all the actions needed to maintain digitised and born-digital objects and data over their entire life-cycle for current and future generation of users” (Yakel, 2007: 337). Curation is about storing and caring for our collections, either passive or active. In general, human beings are collectors, they collect and store items for future use. The active curation part is where the curator prioritises the means to maintain their collections for inventory purposes and preservation for longevity. As soon as information is created, it is managed or organised in a way that it can be traced for use when

needed. Well-curated information is critical to research data as it allows data gathered and created to be preserved over time and accessed by researchers around the world. Just like their analogue counterparts, born digital materials need to be catalogued and organised for retrieval purposes and preservation thereof. Curation of digital information is the key to “sustainability, reproducibility and re-use of reliable and trusted digital resources” (Yakel, 2007: 337 – 338).

2.11 Digital preservation

Digital preservation is defined as the “process of managed activities necessary to ensure continued access to digital materials for as long as necessary” (Beagrie & Jones, 2008: 24). Digital information resources are by their nature unstable and the challenge is the constantly changing of hardware and software necessary for the retrieval of digital files, therefore, appropriate steps need to be taken into consideration to ensure longevity (Bond, 2007: 121). Information centres have been critically associated with the protection and providing access to collections. It has long been the responsibility of information professionals to assemble and organise documents for use and manage the preservation of resources for the future generation of users (Chowdhury, 2010: 210). In order to effectively preserve digital objects, the process needs to start during the creation stage. One of the most important aspects to consider in digital preservation is the gathering of metadata. Metadata plays an important role in digital preservation as it helps place items in context as well as identifying objects (Groenewald & Breytenbach, nd.)

2.12 Summary

Literature has revealed that online information is mostly preferred by users as it is accessible from anywhere at any time. This chapter discussed the factors concerning the dematerialisation of photographic collections and the attributes that come with managing collections in an online environment. Digital information objects flow freely on an online platform, have limitless accessibility and have the potential to reach audience anywhere at any time. The advancement in information technologies has enabled information objects to be modified and suit user needs. Information custodians are moving with the times, adopting the digital world to stay relevant to the future generation of information users. As quoted by Barner (2011), the fifth law of Ranganathan says: “the library is a growing organism”. The following chapter covers the research design and methodologies used in this study.

Chapter 3: Methodology

3.1 Introduction

The purpose of this chapter is to outline the methodology used in this study. This includes the research design, population and sample, data collection instruments and the analysis of data.

The research methodology is a scientific and systematic search for pertinent information on a specific topic. It is driven by a problem that guides the process of seeking information with a clear goal in mind (Habib, Pathik & Maryam, 2014: 3). There are various types of research models, the most common being quantitative and qualitative. The two methods adopt a different position on the fundamentals of the relationship between ideas and evidence. Quantitative research's departure point is numerical measurement of specific aspects of phenomena. Qualitative research is based on intensive study of one or a small number of phenomena. Its focus is on meanings as conveyed by participants in the study (Daly, 2011).

The focus of this study was to establish how to optimise the collection of photographs at The Concrete Institute for effective retrieval. The chapter will present the research methodology which was used to collect and analyse the data required.

3.2 Research design

The study employed a qualitative research method, which studies phenomena within the social and cultural context which they occur. A qualitative research method explores the processes that underlie human behaviour using exploratory techniques such as interviews, surveys, case studies and other relatively personal techniques (Van Zyl, 2014: 213). Qualitative research is defined as "an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyses words, reports detailed views of informants, and conducts the study in a natural setting" (Creswell, 1998: 15). Qualitative research methods allow researchers to collect data in the field where participants experience the problem under the study. The ability to gather information face-to-face; gathering of multiple forms of data, such as interviews, observations and documents is the major characteristic of qualitative research (Creswell, 2009: 175).

The action research method was selected to study the problems of the photographic collection. This research method was chosen as it allows for participatory research.

3.3 Action research design

According to Kalaian (2011), a research design is a general plan for conducting a research study to examine specific testable research questions of interest. Action research is a qualitative research method which is conducted with a view to finding a solution for a particular problem situation in a specific setting (Welman, Kruger & Mitchell, 2006: 25).

Greenwood and Levin (2011) define action research as “a social research carried out by a team that encompasses a professional action researcher and the members of an organisation, community or network who are seeking to improve the participants’ situation. The action research method enables people to find solutions to problems they confront in their everyday lives” (Stringer, 2014: 1). The main purpose of action research is to make change happen and to learn from the experience (Ferne & Smith, 2017). The action research method may include qualitative or quantitative research methods and data collection methods such as questionnaires, in-depth interviews, focus groups, informal conversations, journaling, document reviews and observations. It often includes different ways of knowing as it strives to be inclusive of diverse viewpoints (Davis, 2012).

The action research method involves different stages which participants will work through during the research process. The stages include planning, implementing and evaluation. The stages assist participants in tracking their progress during the research (Stringer, 2014: 9-10). This study has implemented the first two stages of the research. The evaluation stage has not been concluded due to lack of time and resources. The action plan will be reviewed with the participants to identify strengths and weaknesses of the plan and work on strengthening it.

3.4 Population and sample

According to Welman, Kruger and Mitchell (2006: 52), a population is the study object and it consists of individuals, groups, organisations or conditions to which they are exposed. It is regarded as a group of potential participants to whom the researcher wants to generalise the results of a study. The target group for this study was the staff at The Concrete Institute as units of analysis, including stakeholders from other information institutions which have undergone similar projects. A sample from the population was studied as not everyone in the population could be tested. A sample refers to a portion or subset of the population. The importance of a sample lies in the accuracy with which it represents the target population to whom the research findings are to be generalised (Fink, 2011). According to Patton (2002:244, quoted by De Vos et al., 2011: 391), “there are no rules for sample size in qualitative research. The sample size

depends on what the researcher wants to know, the purpose of the inquiry, what is at stake, what will be useful, what will have credibility, and lastly what can be done with the available time and resources”.

Sampling strategies distinguish between probability and nonprobability sampling. Probability sampling provides a statistical basis for indicating that a sample is a representative of the study, while nonprobability is a sampling technique in which participants are chosen based on the researcher’s judgement regarding the characteristics of the target population and the needs of the study (Fink, 2011). Purposive sampling, which is a form of nonprobability sampling was used to identify the sample of this study. Purposive sampling is defined as a sampling in which decisions concerning the individuals to be included in the sample are taken by the researcher, based upon a variety of criteria which may include specialist knowledge of the research issue and willingness to participate in the study. The advantage that comes with this sampling criterion is that the researcher can identify participants who are likely to provide data that is detailed and relevant to the research question. The disadvantage with this sampling is the source of potential bias as the sampling rests on the subjectivity of the researcher’s decision making (Oliver, 2011). According to Stringer (2014: 77), the major attribute in action research is the extent to which the participant has an effect on the problem being studied.

The Concrete Institute is a small organisation, with an intimate number of staff members. Purposive sampling may be the only appropriate method available if there is only a limited number of primary data sources that can contribute to the study. The first group of participants comprises the lecturers and professional staff at the institute. The second group of participants consisted of information specialists in the library field. Purposive sampling was chosen as the researcher has knowledge of the needs of the study. According to Battaglia (2011), this sampling is also known as judgemental sampling. The researcher used judgement to sample the elements that would serve the purpose of the study best.

Table 3.1: Description of the sample frame

Sample description	Representation
Professional staff at the Institute	14
Information Specialists in the library field	5
Total sample size	19

3.5 Data collection

The process of gathering information in research studies enables researchers to extend their understanding of the experience and perspectives of stakeholders affected by the issue under investigation. According to Stringer (2014: 101), the first cycle of action research requires the researcher to gather information about the participants' experiences and perspectives and to define the problem in terms that makes sense in their own terms. They seek to understand the participants' experiences in order to work toward a viable solution. Creswell (2009: 178) mentions that data collection includes setting boundaries for the study, collecting information through interviews, documents and visual materials, as well as establishing protocols for recording information. The collection of data for this study was done by interviews and questionnaires. Primary data for this study was collected from participants and the secondary data was then collected from articles and books on the subject of dematerialisation of information.

3.5.1 Interviews

An interview is one of the data collection instruments in qualitative research and is the most common way of collecting data in action research (Poole & Mauthner, 2014). Brinkmann (2012) refers to interviewing as a conversational practice where knowledge is produced through the interaction between an interviewer and an interviewee or a group of interviewees. According to Kumar (2011), interviews are classified into different categories according to flexibility. They can be structured or unstructured. In a structured interview, the respondent is asked a collection of predetermined questions face-to-face, using the same wording and order which is used with other participants. The advantage of structured interviews is that they provide uniform information and assure comparability of data. With unstructured interviews, there is complete freedom in terms of content and structure. Unstructured interviews are informal and are used to explore a general area of interest in depth. The interviewer is free to ask questions in whatever sequence as there is no list of questions to work through. The respondent has the opportunity to talk freely about the topic.

The advantage of using interviews to collect data is that more information can be obtained and the researcher has the opportunity to restructure questions, especially in the case of unstructured interviews. The disadvantage of using interviews is the possibility of the bias of interviewer as well as that of the respondent (Kothari, 2004: 99). In this study, an unstructured type of interview was conducted without following the order of questions in a form of

discussion. The questions were designed to get a feel of how photographs are managed in the information centre and how the information specialists care for their collections. Only three of the information specialists were interviewed (see interview guide, Appendix B).

3.5.2 Questionnaires

Babbie (2007: 246, quoted by De Vos et al., 2011: 186), defines a questionnaire as “a document containing questions and or other types of items designed to solicit information appropriate for analysis”. As a method of data collection, questionnaires are very flexible and should be carefully constructed in order to obtain facts about the study from participants (De Vos et al., 2011: 186). Trobia (2011) suggests that standardised questions should be used to collect individual data about a specific topic. Standardisation will ensure that all respondents reply to the same set of questions. Collecting data using a questionnaire has an advantage as it is free from the bias of the interviewer, respondents have an opportunity to answer in their own words and those respondents who are not easily approachable can be reached conveniently. The disadvantage of this method is that it is likely to be slow. It is also difficult to know whether respondents are truly representative (Kothari, 2004: 101). For questionnaires to be successful they should be short and simple and the questions should proceed in a logical sequence moving from easy to difficult questions. As there is no one to explain the meaning of questions to respondents, it is important that the questions are clear and easy to understand (Kumar, 2011). In this study the researcher used esurveycreeator, which is an online questionnaire design and management service to design and distribute the online questionnaire to collect data from participants. The choice of questions was informed by the objective of the study to determine how the photographs could be best managed for effective retrieval. The online link was sent to participants sampled for the study via e-mail (see Appendix A).

3.5.3 Pre-test

The testing of data collection instruments is important before the actual data collection. The process involves collecting data from a small number of respondents similar to the study population to help identify questions that do not make sense to participants. It entails a critical examination of whether respondents would understand the questions which the study wants to answer (Kumar, 2011). Welman, Kruger and Mitchell (2005: 148) summarised the purposes of pre-testing the measurement instruments as follows, to detect ambiguous instructions, to help determine the time limits for completing questionnaires and interview schedules. In the case of an interview, the researcher will have the opportunity to notice non-verbal behaviour that could

signify discomfort about the content of the questions. According to De Vos et al. (2011: 195), the objective of pre-testing research instruments is to improve the face and content validity.

With regard to the present study, the questionnaire was tested on selected colleagues in the library field. There appeared to be no ambiguous instructions. The participants understood the instructions and completed the questionnaire as expected. The pre-test assisted the researcher in determining the time needed to schedule the interviews.

3.5.4 Data validity and reliability

Research tools used to measure the behaviour of the study have to be effective for the study to be successful. In order to obtain valid and reliable data, the researcher has to ensure that the measurement instruments used have acceptable levels of reliability and validity (De Vos et al., 2011: 172). Validity of the research instrument refers to “the extent to which research findings accurately represent what is really happening in the situation” (Welman, Kruger & Mitchell, 2005: 142). The two aspects of validity are whether the instrument actually measures the concept in question, and that the concept is accurately measured (De Vos et al., 2011: 173). In this study the researcher used two instruments, online questionnaire and interviews, to collect data from participants. The instruments were designed with similar themes to triangulate the data collected. Reliability is concerned with the findings of the study and relates to the credibility of the findings (Welman, Kruger & Mitchell, 2005: 145). Reliability occurs when a test measures the same thing more than once and results in the same outcomes (Van Zyl, 2014: 115). In order to have a perfect reliability, although rare, Neuman and Kruger (2003, quoted by De Vos et al., 2011: 177), suggest the following procedures to increase reliability of measures: the use of pre-tests, elimination of unclear items and maintaining consistent scoring procedures.

3.6 Analysis of data

Data analysis is “the process of bringing order, structure and meaning to the collected data” (De Vos, et al., 2011: 397). The process involves collecting open-ended data, based on asking general questions and developing analysis from the information supplied by participants (Creswell, 2009: 184). Data analysis is associated with surfacing meaning and understanding from various data sets that may be collected during the action research project as a basis for further action and theory building (Rowley, 2014).

For the purpose of this study, codes were created to analyse and make sense of the data that has been collected. Codes are labels that are used to attach meaning to the data collected. Codes

are used to retrieve and organise information in order to categorise it according to particular themes (Welman, Kruger & Mitchell, 2005: 214). The data collected from interviews and questionnaires was compared to see whether the information specialists view regarding the photographic collection correlates with that of information professionals.

3.7 Summary

This chapter provided a discussion on the research methods applied for this study with a view to answering the research questions. The qualitative research approach was used to answer the research questions and objectives of the study. It also included the population and sample selected for the study, data collection instruments, pre-test, data validity and the analysis of data. The population of this study consisted of information specialists in the library field and information professionals at the institute. The following chapter presents findings from the data analysis.

Chapter 4: Analysis and presentation of findings

4.1 Introduction

The previous chapter described the methodology for this study and provided the framework for data gathering. This chapter focuses on the findings of data collected through questionnaires and interviews. The data collected from the research is presented, analysed, described and interpreted as the next step of the research process. Data analysis is deemed to be an essential part of research as “it brings order, structure and meaning to the collected data” (De Vos et al., 2011: 397).

The main objective of this study was to determine how the photographic collection can be optimised for effective retrieval. The analysis of the data in this study was done in line with the objectives to ensure that the research question is addressed. Questions from the online questionnaire (Appendix A) and interviews (Interview guide, Appendix B) were drafted to collect data that provided an understanding and insight into the management of photographic collections for retrieval purposes. NVivo software was used to analyse the data collected from interviews and online questionnaire, in order to identify the similarities and differences between the responses.

The specific research questions (as explained and motivated in Chapter 1) are:

1. How is the collection of the institute currently organised?
2. What is the understanding among staff members of the benefits of having a digitised photographic collection?
3. What are the best practices and standards that should be used for digitising a photographic collection?
4. What measures will be used to record and help make the collection informative and accessible; i.e. what would constitute “effective” retrieval?

4.2 Data collection sample

The Concrete Institute was selected as a site for data collection as it houses the photographic collection that needs to be managed according to relevant standards for effective retrieval. Purposive sampling was used to identify the sample for this study. Information professionals in the library field as well as professionals at the institute were included in the data collection to get their perspective on how the photographic collection could be managed effectively. Information specialists were interviewed and the professional staff at the institute and

information professionals from different libraries completed the online questionnaire. One of the information specialists interviewed is currently at the institute, one is a retired staff member from the institute and the other one is with the cement company PPC. Purposive sampling was used to identify the sample for the study. Purposive sampling technique relies on the judgement of the researcher when it comes to selecting participants for the study. The researcher decides what needs to be known and find people who are willing to provide information by virtue of knowledge and experience (De Vos, 2011: 392).

4.3 Data presentation

This section presents data collected in line with the objectives of this study. The data collected is presented in themes drawn from the data collection. The analysis was done in the order in which the questions were asked during interviews and in the questionnaire. It has been noted that the respondents of both the questionnaire and interviews did not exhaust every question posed. One interviewee opted not to answer one question. Four participants of the questionnaire respondents omitted at least one question. However, all data was analysed and findings are presented in figures and sub-sections below.

4.3.1 Description of participants

This section presents findings from both the online questionnaire respondents (sixteen in total, including professionals from The Concrete Institute, information specialists, and professional staff from different libraries) and interviewees (three information specialists), summarised in Table 4.1. The questionnaire yielded sixteen responses which is the actual sample size. The data collected from the sample was meaningful, even though some questions posed were not answered in detail. During the data presentation N will represent the total number of respondents, excluding non-respondents for that particular question. The interviewees' identity is hidden for ethical reasons. Eleven questions were prepared for the interviews and twelve questions for the online questionnaire.

Table 4.1 Respondents of the study

[N=19]

Respondents	Interview	Questionnaire	Total	
Professional staff at the Institute		5	5	26.32%
Professional staff from other libraries		9	9	47.37%
Information Specialists	3	2	5	26.32%

4.3.2 Photographs as an information resource

Respondents were required to share their perception of photographs as an information resource and whether the photographic collection should be treated the same way as its book counterpart in collections. This question was important as it identified whether photographic collections are seen as information resources. The response to this question was 100% in agreement with the idea that photographs are indeed information resources and should be treated as such in collections for effective retrieval. The information specialists interviewed alluded to photographs as powerful records of people and events as they bring out ideas that words alone cannot. They are seen as a way of passing down information from generation to generation and a way to find evidence from the past and interpret it. One information specialist interviewed (Interviewee A) associated the collection at the institute with the history of the institute as the photographs date from the 1960s. They emphasised that the photographs contain a wealth of information about the institute as the photographs depict how things were done in the past and they also bring to light information about how the construction industry has evolved in the recent years. The other information specialists interviewed (Interviewees B & C) indicated that photographs are useful in collections as they can be used as evidence for analytical purposes, given that the construction industry relies heavily on technical information and skills. The photographs usually assist with visual clues to help users explain technical problems encountered in the field. One information specialist (Interviewee C) also indicated that the photographic collection at the institute is useful during lectures to help students grasp information about concrete. They later gave an example of the roller compacting machine used to compact roads. The photograph will help students understand and believe that what was captured really happened and to enhance their imagination. They also emphasised that the use of photographs in lectures will give students a glimpse of how the machinery used in the construction industry has developed over the years.

4.3.3 What motivated the information centre to have a photographic collection?

This question was asked of the interviewees in order to understand their reasons for housing a photographic collection. One interviewee (Interviewee A) opted not to answer the question as they could not think of any reason at that point. One information specialist interviewed (Interviewee B) said that the collection has been assembled over many years, largely from its time with the Portland Cement Institute for the purpose of building up a stock of pictures to support its technical work and for historical purposes as photographs are valuable for determining the material culture and landscape of the past. The other information specialist interviewed (Interviewee C) said the collection has been assembled for promotional work. They use the photographs to illustrate talks and showcase the works of concrete. They pointed out that concrete is a versatile material that has great benefits. They added that the beauty with concrete is that it can be of any colour and assume any shape, just about anything an architect can imagine can be delivered. The photographs of concrete strengthen those ideas and prompt creativity in the architectural space.

4.3.4 Benefits of photographic collections

The information specialists interviewed pointed out that photographs are seen as an information resource as they help us understand people, ideas and events from the past as they illustrate what happened. Photographs silently tell a story to individuals, who can benefit from more than just text to grasp a concept, and they lend additional credibility to data. They assist users in the understanding of events by capturing the moment and presenting users with real-life examples. The interviewees alluded to the fact that photographs are a valuable source of information and help to illustrate problems in the technical environment. The construction industry frequently encounters technical problems and photographs allow engineers to have a perspective of what they are dealing with and help with their research. Photographs allow for comparison of cases and also for keeping records of problems in the field of work. One information specialist (Interviewee B) pointed out that the power of visuals should never be underestimated; indicated the collection has to be preserved for future generations to show how things were done before. The information specialists indicated that the photographs are of great historical value of the construction industry and by preserving the collection, the heritage of the institute will live on.

4.3.5 What is the general condition of the collection?

Interviewees were asked to rate the condition of the photographs in the collection. They all mentioned that the collection is in a reasonably good condition, even though it is apparent that some photographs are older than the others. One information specialist (Interviewee A) alluded

to the fact that the analogue photographs are ideal candidates for digitisation and that a digitisation exercise will help with identifying photographs that have to be restored.

4.3.6 Problems relating to photographic collections

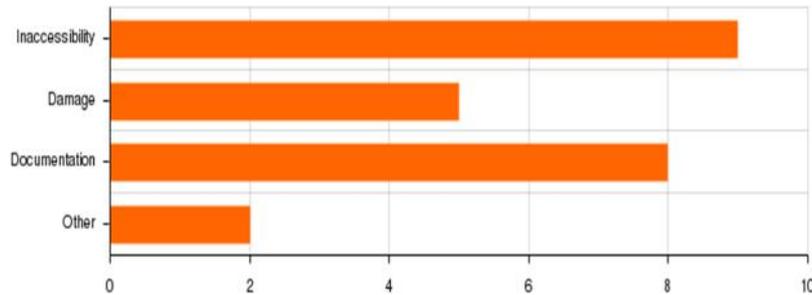
Twelve (75%) respondents (from both the questionnaire and interviews) (see Figure 4.1.) pointed to inaccessibility as the main problem they encounter when looking for relevant photographs in the collection. The responses were incorporated to triangulate data and observe variations in views of the information specialists interviewed and professionals who participated in the online questionnaire. One information specialist interviewed (Interviewee B) specified that an unidentified photograph amounts to nothing in the collection as it is unknown to information users. Interviewee B also pointed out that a photograph will provide greater value when information is available about where and when it was taken and about what the context of the photograph is. When photographic collections are not organised properly according to library standards, information users will have a hard time finding what they are looking for in the collection and could easily lose interest. As custodians of information resources, information specialists need to manage their collections in a way that users would easily locate documents in collections. At the moment, locating a specific photograph takes time as the photographs are not properly organised or linked with any metadata for identification. One information specialist interviewed (Interviewee C) admitted to abandoning the collection in a sense that it was never organised and promoted to information users for their benefit; they said the photographs were not prioritised as they received fewer queries regarding the photographic collection. They also indicated that the reason for photographs being unused may be related to the fact that they are not organised and users may not be aware that such a collection exists. The information specialists (Interviewees A, B & C) also indicated that some of the problems include damage as the photographs are not stored and preserved properly. One information specialist (Interviewee A) pointed out that by digitising the collection, problems with damage would be eliminated as users will be using electronic copies and thus minimising the handling of the original photographs.

Figure 4.1 depicts the consolidated responses from the online questionnaire to problems encountered with photographic collections, and shows inaccessibility as the main problem encountered by participants. A total of nine questionnaire participants indicated inaccessibility as the problem encountered, five participants indicated documentation as the problem and two participants indicated the problem of damaged photographs. Two participants from the online questionnaire also indicated in the additional comments field that one of the problems

encountered is that photographs are not properly organised, resulting in time wasted to find a specific photograph and one participant mentioned that photographs are not catalogued.

Figure 4.1: Problems encountered with photographic collections

[N=16]



4.3.7 How are these problems dealt with?

This question was asked to gain insight into what measures were taken to rectify problems with the collection. The information specialists (Interviewees A, B & C) answered the question, and they mentioned that nobody really took ownership of the collection and it was never prioritised. The collection was only kept, however, it was never utilised. The other information specialist (Interviewee C) said that since there was little public demand, they had time to re-organise their collection and out-sourced storage of their photographic negatives to a civil engineers' institute. Interviewee C said they digitised the photographs and users are now able to access their digital photographs for a minimal fee. All information specialists interviewed agreed that by digitising the collections, the retrieval of relevant photographs would not be time-consuming and the re-filing of the photographs will be alleviated.

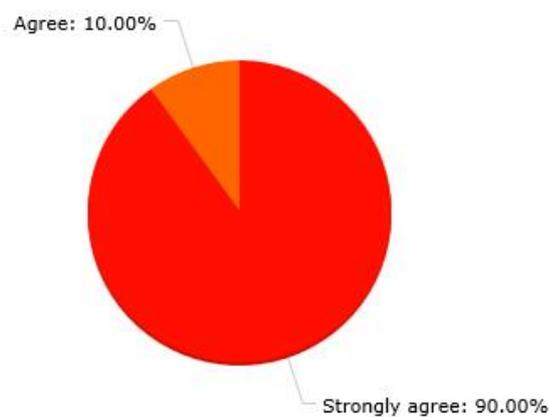
4.3.8 What can be done to enhance visibility and accessibility?

This question was asked to gain insight into how the collection can be made known and serve its purpose of informing. All the interviewees (A, B & C) said they use the collection very seldom, but the collection is valuable and needs to be preserved. The collection needs to be organised according to information management standards and promoted to the construction industry so as to increase the use of the photographs. All information specialists agreed that digitising the collection would improve accessibility of the collection as users prefer the convenience of accessing information online. One information specialist interviewed (Interviewee C) indicated that libraries need to be transformed in order for them to fit in the

changing world. The information specialists interviewed pointed out that over the years, the number of users visiting the information centre has dropped drastically. The ability to search through an online catalogue is a suitable time saver to users compared to thumbing through traditional means of accessing information. The availability of online catalogues also helps as users do not have to physically visit the information centre. Since they know where to find information, they can call or send an e-mail to request that the required information be sent to them electronically. The last resort is for users to physically visit the information centre for assistance. Figure 4.2 shows the percentage of participants who agree with the notion of digitising the collection for visibility and accessibility.

Figure 4.2: Digitisation to enhance accessibility

[N=16]



Figures 4.3 – 4.8 represent the data from the questions in the study, followed by detailed discussion of the results obtained from each question.

Figure 4.3: Frequency of use of photographs

[N=16]

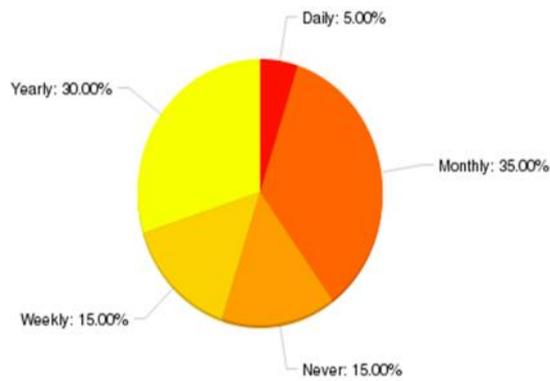


Figure 4.4: The purpose for which photographs are used

[N=16]

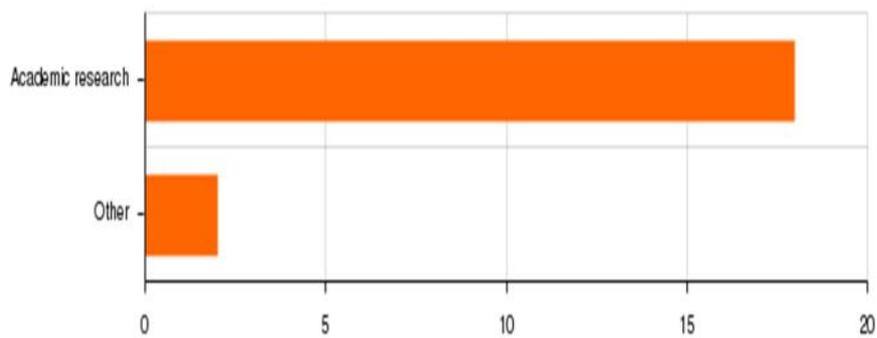


Figure 4.5: Where do you start searching for photographs?

[N=16]

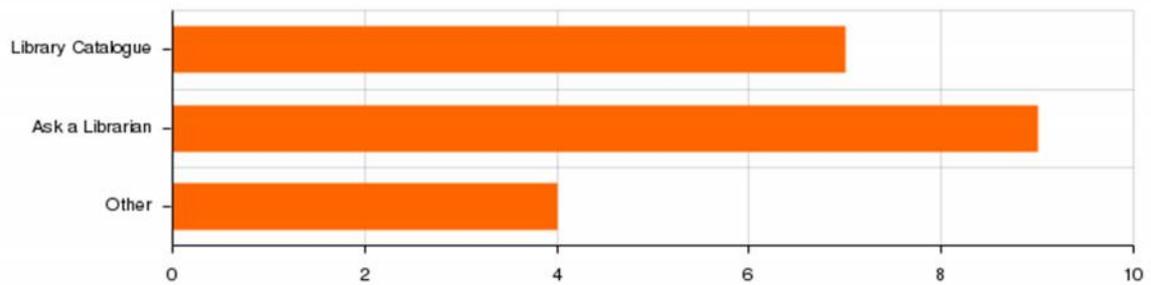


Figure 4.6: Difficulty in accessing photographs in the collection

[N=16]



Figure 4.7: Rate the accessibility of the photographic collection

[N=16]

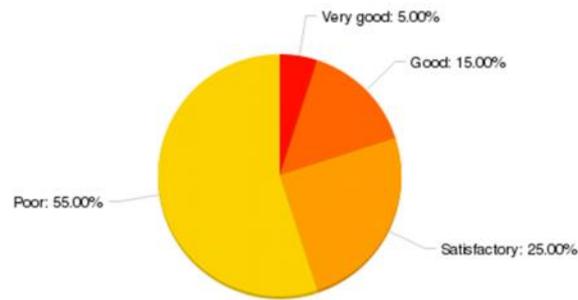
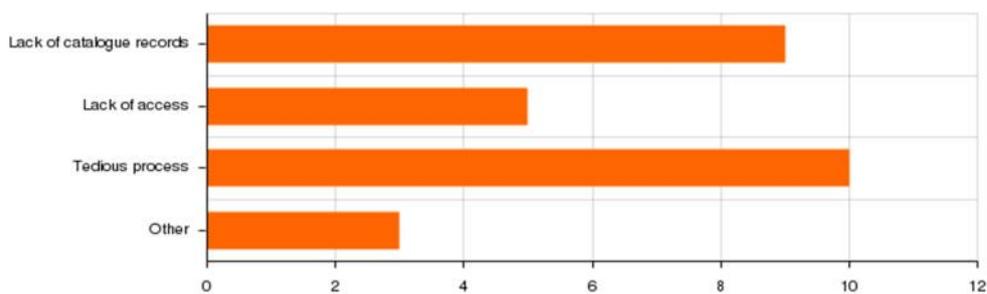


Figure 4.8: Reasons for not using the photograph collection

[N=16]



4.3.9 Use of photographic collections

Questionnaire respondents indicated they use the photographic collection very seldom and usually for academic purposes. Nine questionnaire participants pointed to lack of catalogue records as one of the reasons for not using the collection and also to the process of finding the required photographs being tedious. All information specialists interviewed agreed that users hardly ever ask them for photographs. They alluded to the fact that the collection is unknown

to potential users as it is kept in boxes and not catalogued. They agree that they have neglected the collection to some degree due to lack of personnel. The participants of the study (both interviewees and questionnaire respondents) highlighted the seldom use of photographs. Digitising the collection might take time but the end result will help publicise and make available an unknown and valuable collection to the benefit of information users.

Figure 4.3 shows how frequently the collection is used. Participants indicated that they use the photographic collection as the need arises. The chart indicates that the collection is used at least on a monthly basis by the majority (35%) of users. The chart also indicates that the collection is used daily by at least 5% of respondents, weekly by 15% and yearly by 30%, while 15% of the participants have never used the collection.

Figure 4.4 shows that the collection is used mostly for academic purposes (fourteen respondents). The two participants who chose the 'additional' option indicated that they use photographs for exhibitions, marketing and corporate communication.

Figure 4.5 shows that eight participants request assistance from the librarian when looking for specific photographs. A total of four participants indicated that they search the library catalogue to look for photographs. Four participants indicated in the additional field that they start by browsing the physical collection or the existing digital photographs. They also indicated that they ask anyone who may have knowledge of what is in the collection or ask the curator.

Figure 4.6 shows the level of difficulty that participants face when searching through the collection. The Likert scale shows that finding photographs in the collection is rather difficult for participants, as all six respondents to this question rated the difficulty as very difficult, difficult or neither or hard and none selected the easy option. Only six participants answered this question, which shows that the collection is not user-friendly.

Participants were asked in the online questionnaire to rate the accessibility of the photographic collection, and the results are shown in Figure 4.7. The majority of participants feel that accessibility is very poor. Seven (55%) participants rated the accessibility as poor, four (25%) participants indicated that it is satisfactory, three (15%) participants rated the accessibility as good and two (5%) rated accessibility of the collection as very good. The data collected in Figure 4.7 is in correlation with the results from Figure 4.1.

Figure 4.8 shows why participants do not use the photographic collection. The majority (ten participants) alluded to the fact that looking for photographs is a tedious process and the lack

of catalogue records makes it difficult to locate. Participants indicated in the additional field that not all photographs are listed. The lack of provenance information was also mentioned, implying that users of the collection are not sure if they have the right to use some photographs, and for what purposes. It was also mentioned that most photographs are historic and the people who could assist in identifying the photographs are no longer in the organisation.

4.3.10 What level of description should be adopted to describe the photographs?

The process of classifying and annotating the photographs is essential for the long-term historical value of photographic information in collections as it ensures accessibility. The key to the collection is in its arrangement, so for that reason classification is an essential part of collections. The interviewees (A, B & C) indicated the importance of having descriptive metadata for the purposes of discovery and identifying the photographs in the collection. All information specialists interviewed indicated that photographic collections have to be allocated with a bibliographic metadata to enhance their accessibility. The importance of metadata as a powerful tool to organise and search through databases was also emphasised. All three interviewees also highlighted that the metadata for photographs will not be the same as that for other documents in collections. Photographs need metadata that will describe what the photograph represents, for example, where, when and how the photograph was taken. Such information is important because it indicates the photographer's motivation for capturing the photograph, which leads to easy retrieval. One information specialist indicated that in order for the collection to be documented properly, effort is required to seek assistance from previous staff members with direct knowledge of the collection to avoid misinterpreting the context of the photographs. It was also mentioned that the subject matter of some of the photographs is technical and that it would therefore be of great benefit to give more detailed information about the technical aspects of the content to give context.

4.3.11 Integration with other collections

Two information specialists (Interviewees A & B) agreed that integrating photographs with other collections would help with making the photographic collection known, as the photographs could be retrieved through a single search. The linked relationships between records would result in a seamless discovery platform for users and save them time. They also pointed out that the combination of various information documents turns out to be useful for users who are doing research, because their searches would yield effective results. All information specialists interviewed agree that the ability to search information documents simultaneously is powerful for effective retrieval, and integrating the photographs with other

collections is therefore important. It was also said that integration will help with making the collection known to users who never knew of its existence. The two information specialists (Interviewees A & B) feel that integration is a critical element for the collection as it could increase the value of the collection. One information specialist (Interviewee C) was not in agreement with the integration of the collection as they pointed out that it could contravene the Copyright Act as rights on some photographs are restricted. Interviewee C pointed out that some clients of the institute would not feel comfortable with someone else having access to their photographs.

4.3.12 Additional comments from participants

Questionnaire respondents and interviewees were asked to give comments that might be useful in this study. Participants have given the following comments:

- Digitisation and allocation of metadata will enhance accessibility and also help with preservation.
- Digitisation of photographs will ensure that the handling of photographs is reduced to minimal levels, conservation and restoration of paper is very expensive and as such we must ensure that the preservation methods are adhered to and that they are stated clearly on the policies and procedures.
- Some of the photographs in the collection are of staff members of companies predating The Concrete Institute. Not everyone in the photographs is identified and it would be good to have the help of “older” staff members to help identify the people in the photographs before it is too late.
- Photographs need to be catalogued just like books in the information centre to be accessible.
- A formal policy towards creating a centralised database of digitised photographs is essential to unlock the wealth of information. Identification and metadata relating to historical photographs can only be created from retired employees. This needs to be done as soon as possible to prevent loss of information.
- The allocation of keywords will assist with finding photographs easily. It will also help with identifying what is in the collection for inventory purposes.
- The photographic collection has to be marketed as people may not be aware that such a collection exists.

4.4 Summary

This chapter focused on the analysis and presentation of findings. Purposive sampling was used to select information specialists (three) for interviews and an online questionnaire was sent to sixteen participants. The data collected brought out how the photographs could be better organised for effective retrieval. It is clear from the data analysis that photographs are regarded as useful information resources and digitising the collection will enhance accessibility of the photographs. The following chapter will discuss the main findings, conclusions and recommendations.

Chapter 5: Discussion of main findings, recommendations and conclusion

5.1 Introduction

The previous chapter presented and analysed data collected in this study. The aim of this study was to establish how to best maximise the collection of photographs at The Concrete Institute for effective retrieval. This chapter presents the findings, recommendations and conclusions based on the data collected in Chapter 4 as well as the literature reviewed in the study. Khotari (2004: 345) considers this part of the research process a basic component as the researcher can understand the principle that works beneath his findings. Through the interpretation process, the researcher can link his findings with those of other studies having the same principle and thus maintaining continuity. The objectives of the study were:

- To determine how the photographic collection can be digitally captured and enhanced for easy retrieval.
- To determine the scope of metadata to be considered.
- To determine how the principles of digitisation are applied in practice.

5.2 Discussions and findings

The discussion of findings relates to the objectives of the study and the literature reviewed from the perspective of interpretive theory. Interpretive theory is defined as ontological and epistemological tools used in research which is concerned with the understanding of how individuals or groups create meaning in their everyday practices, communications and lived experiences (Bhattacharya, 2012). The core belief of this theory is that the reality we know is socially constructed. The interpretive approach of this study will help staff of the institute with their routine operation with regard to the collection of photographs and understand their unique challenges. Interpretive theory investigates how individuals make sense of their experiences. The application of interpretive theory allowed the researcher to gain an insider perspective of the photographic collection being studied and help make sense of the participants' experiences with the collection. This study described and interpreted lived experience of participants and connected the findings to existing theory (VanScoy & Evenstad, 2015:341). This study employed a qualitative research method as it studies phenomena within the social and cultural context which they occur. Qualitative research allows the researcher to collect data from participants in their natural environment where the problem is experienced (Creswell, 1998: 15).

5.2.1 How the photographic collection can be digitally captured and enhanced for easy retrieval

Photographs are becoming part of information resources as they preserve a moment in time. They are unique information resources and deserve the same kind of attention as other information resources in collections. The advancement in technology has made it easy for photographs to be captured anywhere at any time and as information resources, and they ought to be preserved for retrieval purposes. In order for us to realise the full potential of photographs in collections, we need to invest in their on-going care and documentation. The collection of photographs that is currently housed at the institute is not properly organised. In order to preserve the collection for longevity, information professionals have to keep the collection updated by using relevant standards. All information specialists interviewed and the questionnaire respondents agree that digitising the collection will improve the accessibility of the collection, as was shown in Figure 4.2. The literature reviewed shows that it is the responsibility of the information professionals to preserve, protect and provide stewardship for information resources and provide long-term access (Russel, 2000).

The information professionals interviewed expressed the importance and the use of photographs in the technical environment such as The Concrete Institute. Photographs are regarded as unique assets of the institute in the extent to which they serve the mission of the institute and therefore compel a case for preservation. They noted that photographs could be used as evidence for analytical purposes as the construction industry relies heavily on technical information to make sense of their day-to-day problems.

As pointed out in the Literature Review, it is the consensus of many authors (Singh, 2015; Ladd, 2015; Adzic, 2013) that technology has made it easy for information resources to be created in a digital format and to enhance access to resources. The majority of institutions that house photographic collections find digitisation attractive as it helps with the protection of vulnerable originals. Clark and Frey (2003) pointed out that the only reliable method to preserve photographs for longevity is through digitisation. The digitisation of photographs will allow them to be preserved in the long term and enable online access to collections. The participants in this study agreed with the notion of digitally preserving photographs for long-term use and for accessibility since users prefer the convenience of accessing information online. Smith (2004) also points out that studies show that most users prefer desktop delivery of information. The information specialists interviewed alluded to the fact once the

photographs could be digitised and made available online, it could drive increased use from users as the collection is hidden in its current state.

Online resources offer a great advantage to users as they allow users to access information resources remotely. This supports the point highlighted in Chapter 2 by Van Campenhout (2013) that dematerialised information is flexible and has limitless availability to users. All information professionals who participated in the study agreed that digitising the photographs will add value to the collection as more people could easily access the collection (see Figure 4.2).

In Chapter 4, it was suggested in the analysis of the additional field section that digitisation will also help to maintain the inventory of the collection as well as in marketing the collection to more users in the construction industry. As the study indicated that one of the benefits of digitising collections is access, information professionals have the responsibility to ensure that their collections are accessible. Housing a collection that is not easily accessible to users is rendered useless and a waste of space as the collection is unused or unknown to information users. Digitising the collection will also help to incorporate physical collections, text and image-based collections with each other, and build a well-documented database of information resources on the subject of concrete. It is interesting to note that one respondent highlighted concerns about digital rights pertaining to digitised items in the collection. The importance of respecting intellectual property rights was discussed in Chapter 2, section 2.9 of this study. Digitisation raises the possibility of infringing copyright when the works that are owned by third parties are reproduced. In his research, Netshakhuma (2016: 124) observed that some digitised archival materials in the liberation archives have been placed online without the consent of the creators.

The study illustrates that photographs represent a source of information in the construction industry which is of great importance in illustrating information about concrete. Therefore, making photographs accessible is crucial since the resources that are inaccessible are rendered useless. The literature on enhancing accessibility in collections indicates that digitising and making the collection accessible in an online platform provides great benefits for both information custodians and users. Digitisation provides a solution to traditional library problems such as conservation and remote access to collections (Maurya, 2011: 288). This study reveals that digitising the photographs at the institute will help with the preservation issues and increase accessibility of the collection.

5.2.2 Scope of metadata

From the results of this study as presented in the previous chapter where interviewees were asked about problems relating to photographic collections, it is clear from their responses that information resources that have no metadata are difficult to trace in collections. Information resources are useless unless they are accessible to users, and the findings of this study confirm the consensus reflected in the Literature Review by NISO (2004) and by Xie and Matusiak (2016). Metadata are elements used to describe information resources for the purpose of discovery. Metadata helps us in adding context to information resources and it represents the “aboutness” of a resource in a discovery system (Mitchell, 2015: 9).

The results in Figure 4.4 provided an insight into how photographic collections are used in the information centre. Accessibility appears to be a key factor in determining the value of the collection. Figure 4.8 indicated that users are reluctant to use the collection as it lacks catalogue records for easy retrieval. NISO Framework Working Group (2007) indicates that collections should be described in order to be discovered. It also states that metadata is one of the most challenging aspects in digital resources. The information professionals interviewed reported that the collection is underutilised due to lack of metadata making the process of locating photographs being tedious. Photographs are unique objects and adding metadata to them will assist in quicker resource discovery. The information professionals interviewed agreed that descriptive metadata for the photographs will help with identifying them and grouping them together according to subject. Metadata about photographs is important as it provides users with their description and makes them searchable.

5.2.3 Principles of digitisation

Institutions invest in digital projects for several reasons. The reasons include among others to provide access, to reduce over-handling of material for preservation purposes and to assist in promoting the collections. Mitchell (2015: 2) points out that the advancement of information technology in our daily lives has pushed information professionals to be aware of the digital literacies that support information creation, management and use. This means the ability to design, build and manage digital information resources.

Digitisation of photographs has been seen as an effective means in the management of photographic collections. The results in this category indicated the growing importance of digitising photographs to enhance accessibility and for longevity. Information professionals interviewed agreed that photographs are vulnerable materials, therefore, digitising the

photographs makes it possible to offer users access to digital copies instead of originals, and thus preventing damage caused by frequent handling of the original photographs. Conway (2000) points out that digitisation offers an advantage of delivering information directly to the user without human intervention as information can be retrieved remotely.

Institutions that undertake digitisation of their collections need to familiarise themselves with the best practices in the digitisation world. The unstable nature of digital technology demands that technical standards be applied to prevent digital files from becoming inaccessible in the future. The standards applicable in building successful digital collections are important as they guide the description and representation of digital information. It is advisable to choose open standards for interoperability to ensure consistency of digital collections. This study indicated that the available standards in digitisation can assist institutions in creating collections that will be consistent and accessible in the future. The building of online information is unique to each institution; therefore it is up to information professionals to build digital collections that will be useful to their user needs and fulfil their institution's goals. The information professionals also alluded to the importance of respecting intellectual property of their collections as mentioned by the NISO Framework Working Group (2007). Therefore, before undertaking their digital projects, they will ensure that they have the right to digitise photographs and put in place restrictions to photographs that are not in the public domain.

5.2.4 Integration to other collections

The interviewees were asked how the photographs could be integrated to other collections in the information centre. Integrating collections enables discovery of materials through a single search. According to Simmons (2015: 130), "connecting people with information is at the heart of information professionals' work." It is the responsibility of information specialists to acquire and organise information that is easy to find. Information resources such as photographs need to be described and be linked to other information resources of similar subjects to afford information users with a choice of resources. The dematerialisation of photographs will enable integration as information resources could be linked hence adding value to the collection. One interviewee pointed out that restricted materials could be exposed, thus contravening the Copyright Act. Levine (2000) suggests that information professionals should educate themselves and be familiar with the legal issues. He also points out the importance of establishing policy frameworks for consistency when working with digitisation projects.

5.3 Reflection

The collection of photographs housed at The Concrete Institute's information centre was a valuable study as it reignited how we manage collections as information custodians. Too often we get caught up with our daily routines and tend to neglect other valuable information resources such as the photographs at the institute. This action research study was useful in revealing a plan of action needed to manage the photographic collection at The Concrete Institute. The research process reached all the objectives of the study in terms of effectively managing the collection and preserving it for future generations. This study also proved to participants that they were able to take responsibility of their own problems and find solutions to the problems they encounter in their line of work.

5.4 Conclusion

Based on the discussion of the main findings, the researcher has made the following conclusions:

- The information centre staff at The Concrete Institute has committed to managing their photographic collection in an effective manner in order to preserve it for future use and enhance accessibility of the collection. The information professionals have gathered photographs of the same subject and created keywords to enhance findability. They are also working with the technical staff to help with creating metadata for the photographs saved on a computer hard drive. Metadata will allow information users to access photographs in a timely manner. The technical personnel are also helping with adding photographs of their site visits to help build the collection as it forms a crucial part of research in the construction environment. Photographs have proven to be research documents and carriers of information in the technical environment.
- The information centre will embark on a digitisation project of photographic collection that faces various challenges such as budget constraints and lack of trained manpower. Despite the challenges faced, the staff at the information centre is determined to see through the digitisation project to enhance access to the collection. The digital photographs would be integrated to the central library system and therefore become searchable to users.
- Information professionals understand the need for intellectual property considerations while undertaking the dematerialisation project. It was established that some photographs in the collection have restrictions and they have to respect the intellectual

property law. Best practises in digitising resources should be followed to ensure consistency and accessibility.

- The dematerialisation of the photographic collection at The Concrete Institute will benefit the construction industry information users who use other collections housed at the institute for research purposes. The participants in this study viewed the collection as a valuable resource which could benefit the industry further if it is managed effectively and improve accessibility. Information about concrete is of a technical nature hence the use of photographs to help illustrate the technical problems as photographs capture moments and silently tells the story. Dematerialisation of the collection will foster a greater understanding of the material they hold. The allocation of metadata to the photographs will facilitate easy retrieval and describe the technical aspects of what the photograph represents.

5.5 Recommendations

The recommendations are based upon a correlation between the literature reviewed and the findings of the study. The study has indicated that collections which are digitised and allocated with metadata are easily accessible. It will be useful for the information centre to set up a project to digitise the photographs and reach out to retired staff members to assist with identifying historical photographs of the institution before it is too late to source and capture vital provenance metadata. The information professionals need to develop a digitisation policy that will stipulate the expected standard and requirements for digitising the photographs to ensure uniformity. The policy will provide guidance for staff and ensure that the photographic collection is dematerialised effectively. Similar studies used in this study also indicated the importance of having a policy in place for digitisation projects (Sekikome, 2016, Kusekwa, 2012). A factor that should also be considered is to identify the resources that will enable the digitisation project to succeed. The resources include manpower, scanners and budget to cater for the project. Staff members need to be trained and attend digitisation workshops to sharpen their skills and incorporate the collection of photographs into the digital world.

The study has shown the benefits of dematerialising collections and how accessibility is essential to the collections' usability. However, it would be useful to engage in a further study to determine the importance of photographs and to clarify their use in the construction industry. Further research with regard to the allocation of metadata would be needed to ensure consistency when describing the photographs. The process is needed to complete the full cycle

of action research to allow the evaluation of the changes that have been implemented to the photographic collection housed at the institute. There is also a need to investigate procedures followed by other institutions in dematerialising their photographic collections.

5.6 Summary and general conclusion

This chapter discussed the main findings of the study in relation to the literature reviewed and the theory that informed the study. This study was informed by interpretive theory to help understand how the collection of photographs could be managed for effective retrieval. Photographs present us with visual experiences of the past and they require efficient management to fulfil its purpose of informing. This study has indicated the importance of dematerialisation and allocating metadata to photographs to help identify and enhance accessibility of information resources. Photographs that are easily accessible to users are not hidden in collections and they are usable. Information professionals have the mandate to ensure their collections are accessible to users with ease. The use of computers to deliver and manage information is now a reality. Engineering disciplines have to make use of information technology systems to stay abreast and to serve information efficiently. The technical nature of information about concrete needs information professionals to apply their skills in sharing value added information materials. Concrete has a long history of usage, it is one of the world's most important building material. The versatility of concrete means that a lot of people are working with concrete, therefore it is important to provide information resources that are flexible and accessible. Dematerialising information about concrete could be beneficial as it would help transform the traditional means in sharing and viewing information to reflect a changing paradigm in society.

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APPENDICES

Appendix A: Questionnaire

Consent to participate in the survey

Dear Prospective participant,

You are invited to participate in a survey conducted by Master of Philosophy student from the Library and Information Studies Centre at the University of Cape Town under the supervision of Mr Richard Higgs.

This survey has been designed to study the effect of how to best maximise photographic collections for effective retrieval. You were selected to participate in this survey as professionals in the information field, which is a convenient sample.

By completing this survey, you agree that the information you provide may be used for research purposes. You are, however, under no obligation to complete the survey and you can withdraw from the study prior to submitting the survey. The survey is developed to be anonymous, meaning that we will have no way of connecting the information that you provide to you personally. If you choose to participate in this survey it will take up no more than 5 minutes of your time. Your participation will be greatly appreciated.

Regards,

Kizzy Shipalana

Questionnaire link:

An online questionnaire will be sent electronically to participants. Survey link:
<https://www.esurveycreator.com/s/9cbfa22>

Appendix B: Interview consent form

Dematerialisation of a photographic collection at The Concrete Institute’s Information Centre

Library and Information Studies Centre
University of Cape Town

The Concrete Institute Staff

Introduction

I am a postgraduate student at the University of Cape Town currently engaged in my research towards a Master of Philosophy specialising in Digital Curation in the Department of Library and Information Studies. My research topic is: Dematerialisation of a photographic collection at The Concrete Institute’s Information Centre. I decided to interview staff at the institute to obtain the data needed for my study. Your participation will be greatly appreciated.

The names of the interviewees will be kept anonymous and all the data collected will be kept confidential. Participation is voluntary and if you wish to withdraw from the study at any time you are free to do so.

Consent

I, hereby give my consent to voluntarily participate in this study by fully responding to the interview questions from the researcher, Kizzy Shipalana. I have been fully informed on what the study is about and how the results of this interview will be handled. Data collected will be kept confidential and used only for study purposes. I am comfortable to make a contribution to this project and I know I can disengage from this exercise at any time.

Signature.....

Date.....

Interview guide for the study on dematerialisation of photographs

Background to the study

This research study serves as an important contribution towards efforts aimed at dematerialising the photographic collection housed at The Concrete Institute's Information Centre for effective retrieval and longevity. This research is a fulfilment of a Master of Philosophy degree requirement for the Library and Information Science Centre at the University of Cape Town.

Research title:

Dematerialisation of a photographic collection at The Concrete Institute's Information Centre

Interview questions

1. What motivated the information centre to have a photographic collection?
2. What have been the benefits of having a photographic collection at the information centre?
3. What is the general condition of the collection?
4. What problems relating to the photographic collection has your library encountered?
5. How did you deal with those problems?
6. What are the challenges in accessing the photographs?
7. What can the library do to enhance visibility and accessibility of the photographic collection?
8. What level of description should be adapted to express the photographs?
9. How can the photographic collection be integrated to other collections in the information centre?
10. How frequently is this collection used? Will it be used more frequently in future?
11. Do you have any comments to add or information that you think might be useful in this study?