

Running Head: DIGITAL PRESERVATION

Digital Preservation and Interpretation in the Oregon Parks and Recreation Department:
A Mixed-Method Study

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Abstract

The primary research problem for this exploratory mixed-methods study is to determine to what extent interpretive rangers employed by the Oregon Parks and Recreation Department (OPRD) understand, implement, and collaborate on digitization projects. Three park units representing three major geographical divisions of Oregon: Silver Falls (Willamette Valley), Wallowa Lake (Eastern Oregon), and Sunset Bay (Coastal Region) will undergo a qualitative interview to garner case study snapshots of the state of digital preservation in Oregon State Parks. All interpretive rangers and interns employed by OPRD, including members of the management team and key operators of the State Historic Preservation Office (SHPO) will be members of the quantitative subject group undergoing an aptitude test about digital preservation as well as a survey which will solicit such information as how much of the park unit's budget is designated for preservation, whether the park unit has an individualized preservation plan, etc. The design of the quantitative portion of the study intends to use a census approach in order to capture a general picture of how digital preservation is being used in Parks. Results of the management's prior knowledge will be factored out from practicing interpretive rangers and interns, as well as OPRD's four park management regions and its Ocean Shores Management Program in order to look for themes and trends within the subgroups. Themes and trends from the qualitative portion of the study may inform the secondary and quantitative portion of the study. A review of the literature may also inform qualitative interview questions which focus on the five overarching themes of digital preservation: policy and scope, preservation, access, technology, and training. Follow up studies may include quantitative value analysis of specific digital preservation products, and qualitative case studies of digital preservation plans implemented in specific park units.

TABLE OF CONTENTS

CHAPTER ONE: OVERVIEW OF THE STUDY.....	5
• Introduction and Background.....	5
• Purpose.....	6
• Significance.....	7
• Definition of Terms.....	8
• Summary.....	9
CHAPTER TWO: REVIEW OF RELATED LITERATURE.....	10
• Introduction.....	10
• Policy & Scope.....	11
Technology.....	12
• Preservation.....	15
• Access.....	17
• Training.....	19
• Summary.....	21
CHAPTER THREE: METHODS.....	22
• Introduction.....	22
• Statement of Hypothesis.....	22
• Rationale for Design.....	24
• Role of the Researcher.....	24
• Participants.....	26
• Instruments.....	27
• Design and Procedure.....	29
• Summary.....	30

LIST OF REFERENCES.....31

APPENDIX A: Participant Aptitude Test, Quantitative.....33

APPENDIX B: Sample Participant Survey, Quantitative.....37

APPENDIX C: Sample Interview Questions, Qualitative.....39

CHAPTER ONE: OVERVIEW OF THE STUDY

Introduction and Background

Acquisition and interpretation of cultural and natural resources is fundamental to the mission of the Oregon Parks and Recreation Department (OPRD), “The mission of the Parks and Recreation Department is to provide and protect outstanding natural, scenic, cultural, historic and recreational sites for the enjoyment and education of present and future generations.”

Preservation and access are synonymous with the phrase, “to provide and protect.” Preservation and access in the 21st century has expanded to the management and use of digital content on the world wide web; “Because exhibits, signs, films, and other interpretive media are the major vehicles by which parks communicate with visitors, continued social science research on interpretation is a critical area for the future of park and recreation management” (Silverman & Barrie, 2000, p. 36). This study will examine whether digitization of interpretive media is occurring in Oregon State Parks, in addition it will inquire whether interpretive personnel are adequately trained for archival tasks and if collaborative efforts are being made between OPRD, schools of library and information management, which usually offer an archives certificate, and other local organizations that have an interest in preservation.

Emporia State University’s School of Library and Information Management (SLIM) *Archives in the Park* class (LI861: Current Issues in Information Transfer) taught by Dr. Nancy Thomas during Fall 2008, culminated with a final project in which each graduate student had to forge a partnership with an institution that had an archival need. As a fledgling archivist I completed my final project at Silver Falls State Park, a “crown jewel” of the Oregon Parks and Recreation Department. Silver Falls did not have a formal archive so recommendations were made as to the re-housing, organization, and digitization of culturally significant materials in possession of the Park. After initial intervention to salvage these materials from various milk

crates, boxes, and file folders, work was done to scan items and catalog them in Past Perfect; a commonly used museum software. During the course of the project it came to my attention that additional materials pertinent to the Park's history were housed at the Oregon Historical Society (OHS), the Oregon Department of Transportation (ODOT), and a regional repository in San Francisco. As a library student it struck me that materials, regardless of their provenance, were not only removed from their place of origin, but lacked a central database linking them together. While working with the Interpretive Ranger on the project it also occurred to me that interpretation cannot occur as effectively without a curator or librarian (whether that be a duty of the interpreter, an organization commissioned by the park, or a collaboration between the two) to acquire, maintain, and preserve cultural and natural resource materials significant to the Park's history. I began to wonder if other OPRD parks were faced with the same backlog and lack of cohesion. The primary research problem for this study is to determine to what extent interpretive rangers employed by OPRD understand, implement, and collaborate on digitization projects.

Purpose

The purpose of this sequential mixed methods study is to better understand digital preservation in Oregon State Parks by converging both qualitative and quantitative data (QUAL-quant). In the study, attitudes about the use of digital preservation as a way of documenting history and preserving OPRD's cultural and natural collections will be explored using qualitative interviews with interpretive rangers of Oregon State Parks at three locations: Silver Falls State Park, Wallowa Lake State Park, and Sunset Bay State Park. Following the qualitative portion of the study an aptitude test and a census survey will be used to measure knowledge and preparedness of all OPRD interpretive rangers, interpretive interns, managers, and selected employees of the State Historic Preservation Office (SHPO) regarding digital preservation of interpretive media.

Significance

This study will not only contribute to the field of social science and library and information science (LIS) research, but it will contribute to a body of research pertinent to OPRD, highlighting the relationship of interpretive rangers and the State Historical Preservation Office (SHPO) to interpretive media held in park collections across the state. The study will also determine whether digitization is part of the greater Oregon Historic Preservation Plan and the goals of the 2005-2011 Oregon Heritage Commission. Components of the study have the potential to identify and emphasize staffing, training and funding needs within the organization—as they relate to preservation and access. Due to the mixed methods nature of the study, data on three of the State Parks (akin to action research) will be especially valuable to regional and park managers associated with those locations. The National Park Service (NPS) may also have an interest in the study, as they face similar material backlogs, staffing shortfalls, and questions regarding digitization of collections.

Studying digitization in OPRD could serve as the catalyst for performing a more comprehensive assessment of preservation services and products by way of “value analysis.” “Critical to value analysis is the use of multidisciplinary teams to identify functions of a product, establish worth for those functions, and provide alternative ways to accomplish the necessary functions at the lowest cost through the use of creative techniques” (Harmon, 2006, p. 430). Digitization as an end product must then be examined through the examples of similar agencies and parks. For example, NPS developed their own Museum Exhibit Planner database application at the Harpers Ferry Center, an interpretive design center serving all NPS units. California State Parks has an exemplary website (www.parks.ca.gov) which advertises their role in caring for “over one million museum objects, two million archaeological specimens and three million archival documents in more than 120 parks and curatorial facilities statewide.” After reviewing

the preservation plans of other agencies and the results of this study, OPRD might choose to look at developing or purchasing an agency wide database, (or creating a union catalog in partnership with places such as the Oregon State Library and the Oregon Historical Society) that centralizes digital park collections. In order to determine what would best serve the interest of the agency's mission, a combination of park staff, stakeholders, and media specialists (archivists, librarians, and museum curators) could use the data from this research in order to conduct further inquiry in specific corners of the digital preservation debate.

Definition of Terms

The National Association for Interpretation (NAI), funded by the Environmental Protection Agency, collaborated with the United States Fish and Wildlife Service (USFWS) and the Institute for Learning Innovation in order to organize a database of common terminology used by interpreters, environmental educators, and historians among others in settings such as parks, aquariums, zoos, nature centers, historic sites, and museums. For the purposes of this study the term "interpretation" as defined by the NAI Definitions Project will be defined as, "A mission-based communication process that forges emotional and intellectual connections between the interests of the audience and meanings inherent in the resource. "Media," as defined by NAI shall be, "Means, methods, devices, or instruments by which the interpretive message is presented to the public." "Curator," shall be defined by NAI as, "A person knowledgeable about and trained in a field related to the collection in his or her care and is responsible for maintaining the overall well-being and scope of that collection." The term curator is of special interest to the discipline of Library and Information Science (LIS), as the definition is closely related to that of the term, "librarian." Indeed, one of the goals of the proposed study is to demonstrate the need for increased collaboration between librarians local to individual OPRD properties and Park interpretive personnel.

“Digital preservation shall be defined as, “combin[ing] policies, strategies and actions to ensure access to reformatted and born digital content regardless of the challenges of media failure and technological change. The goal of digital preservation is the accurate rendering of authenticated content over time.” The definition of “Digital Preservation” is derived from the Association for Library Collections and Technical Services (ALCTS) a division of the American Library Association (ALA). The medium definition of “Digital Preservation” was prepared by the ALCTS Preservation and Reformatting Section, Working Group on Defining Digital Preservation conducted at the ALA Annual Conference, Washington, D.C., June 24, 2007. Short and long definitions are found on the ALCTS website. Digital preservation is a more comprehensive and theoretical approach versus the physical aspect of digitization, that is to say, “the conversion of any type of original, be it paper, photographic prints or slides, three dimensional objects or moving images into a digital format” (Astle & Muir, 2002, p. 67). Digitization then is the technological implementation of digital preservation policy. Additional definitions are located in Appendix B, an example of one of the proposed instruments being used in this study.

Summary

Preservation and access are key components of OPRD’s mission. This exploratory mixed method study seeks to establish five themes of digital preservation and prior knowledge of OPRD and SHPO staff. A qualitative interview with three park units will be followed by the administration of quantitative instruments that intend to collect data on the current status of digital preservation in the OPRD. Due to funding, staffing shortfalls, and training, digitization of park and historical collections has not been implemented at a rate equal to federal, academic and public libraries, early adopters of the preservation tool (Liu, 2004, p. 339). Through review of the literature and discussion of other agencies that have implemented successful digitization projects,

this study serves as a catalyst to develop digital preservation guidelines for OPRD interpretive rangers and managers with cultural and natural resource collections. The National Association of Interpretation and the Association for Library Collections and Technical Services have defined key terms associated with digitization. Digital preservation is a current trend in LIS that warrants further study within the context of specific agencies facing issues of preservation and access.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

Introduction

Digitization has been around almost as long as mainstream desktop computing. In 1977 the Apple II made its debut, and 1981 brought the IBM PC; four years later the first PC and Apple desktop publishing programs were brought to life. First mention of digitization occurs as early as 1986 in a paper presented at the Association of College and Research Libraries conference in Baltimore entitled, "Conservation, preservation, and digitization" (Lynch, C. A., et. al.). In 1988 The National Agricultural Library announced a cooperative project with 42 land grant libraries in *Library Hi Tech*, "to test a new method of capturing full-text and images in digital format for publication on CD-ROM disks" (Andre, P. Q., et. al.). Scanning of selected agricultural collections took place first and then the 42 participating libraries field tested "the microcomputer/CD-ROM workstations, search software, and collections on CD-ROM disks." A few short years later, in 1990, Tim Berners-Lee wrote a prototype for the World Wide Web incorporating his other creations: URL, HTML, and HTTP. According to the Current Population Survey, by 1997 one in five Americans had used the Internet at home, work, or school (U. S. Census Bureau); this, only 20 years after the Apple II. In reviewing the body of literature on digital preservation, which has expanded rapidly from the mid-1980's, five distinct themes begin to emerge in the context of OPRD's primary interpretive media collections: policy and scope, preservation, access, technology, and training.

Policy and scope

A digital preservation policy is a foundational document which outlines not only how the collection should be handled, but what should be included in the collection. When developing a park policy on digital preservation it is important to keep in mind all possible stakeholders, soliciting their input so that the policy, or working theory behind the collection is as inclusive as possible, also considering factors unique to the park unit. The collection's policy is the definitive word "toward the realization that perpetuating digital materials over the long-term involves the observance of careful digital asset management practices diffused throughout the information lifecycle (Lavoie, 2004). It was previously thought that triage, if you will, or rescue of fragile materials in danger of decomposition should be a primary consideration. In practice, the digitization of tenuous items may contribute to further deterioration of the item. Weighing preservation and access are essential to defining scope, as are considering local history, community interest, and how to handle donations. The scope of a collection defines the width and breadth of what qualifies to be in a particular collection.

In a study completed by Silverman and Barrie (2000), it was recommended that the development of interpretation theory not only stays close to the data but considers perspectives from all groups involved in the interpretation experience thereby laying the groundwork for implementing digital preservation. "A grounded theory triangulated by data source could include the perspectives of interpretive media producers, interpreters, and visitors in order to develop a theory that would capture the interactive nature of the interpretive experience" (42). I would add that without interpretive media curators there would be no primary sources from which to produce new media, interpretation, and interactive visitor exhibits. Establishing how a park will handle access, stewardship (or management), and preservation of its digital and archival collection is the key tenant of policy-writing.

Policy needs to account for auditing, authentication, monitoring (authority control), and association of affiliated metadata (searchability and interoperability). Storage and backup procedures, disaster planning, and digital rights management (copyright considerations) are additional considerations of stewardship. The financial, health, and science industries have taken a cue from the Copyright Clause of the U. S. Constitution (Article 1, Section 8) which “set[s] the stage for policy with respect to the rights and dissemination of information in the U. S.” (Berman, 2008, p. 52). Community appraisal, or scope, evaluates and selects interpretive media for long-term curation, assessing relevance to park lore and relation to natural and cultural resources. Coverage should be consistent and predictable or stakeholder interest may diminish.

In a study conducted by Astle and Muir (2002, p. 68) on public libraries and archives in the UK the authors point out an earlier study (Hampson, 1998) that suggests the selection policy for digitization should be based on written criteria that, while variable between organizations, may be distilled to four essential questions:

- Is there sufficient demand for a digitized product from the customer?
- Does the cost of digitization match the value of the source material?
- Can the material be safely and successfully digitized?
- Can copyright permission be obtained?

If any of the questions are answered negatively, OPRD should profoundly consider monetary and staffing constraints before pursuing digitization of the item in question; however these questions should spawn a multitude of additional questions, and from those answers it may be determined to what extent digitization should be pursued.

Technology

In order to secure the long term persistence of digital content a variety of technological considerations must be made. While digitization is marketed primarily as an improvement to a collection--preserving fragile media sources and allowing them to be circulated digitally--there are also some downsides. For one, the World Wide Web boomed faster than digital broadband

could be deployed (Lynch, 2002) and other issues such as the rate at which technology is evolving, digital rights management, copyright questions, and compelling content also tripped up the speed at which consumers and content providers began engaging each other. On the upside, prior to the “dot com boom and the commercial gold rush that reshaped the Internet” cultural heritage institutions were some of the first suppliers of free content on the web and they remain, “an important reason why the public increasingly relies on the Net as an information source.” As technology evolves, so do the standards. Metadata and image quality are just a few of the standards and best practices maintained by the Digital Library Federation, “a consortium of libraries and related agencies that are pioneering the use of electronic information technologies to extend collections and services” (www.diglib.org). Furthermore, those who remain at the forefront of their field: the Institute of Electrical and Electronics Engineers, The Society of American Archivists, and the Library of Congress among others continue to build technology, standards and infrastructure as well as developing and managing networked information content.

Metadata, or data that describes other data, such as Encoded Archival Description (EAD), Extensible Mark-Up Language (XML), and formats such as .JPEG and PDF files are the engines through which original media become digitized. Prior to attaching metadata to the data, the original media must be captured using the least invasive equipment, and the most versatile software. “There is a trend toward using mounted digital cameras for digitizing, rather than flatbed scanners” (Liu, 2004, p. 342), but they are more costly. A little online research reveals that flatbed, film, and sheetfeed scanners cost as little as \$200 and as much as \$5,000, although this still does not compare to the massive robotic book scanners, such as the one owned by Stanford University (www.sul.stanford.edu/depts/dlp/bookscanning), which can cost upwards of \$35,000. However, with a good digital camera and a little innovation it is possible to come up with a homemade scan dock to capture 3-D models, dioramas, and a variety of ephemera.

One of the local technology success stories is the digitization of SHPO's Paper GIS (Geographic Information Systems) collection. After an initial inquiry, SHPO decided to convert their collection of Paper GIS; however they discovered that scanning is not without its drawbacks, "Of the 972 documents that were scanned, three were damaged in the scanning process, though not destroyed. The risk of damage increases as the condition of the documents decreases" (ESRI, 2002). However, "there is also the probability of a future phase combining the new SHPO digital data with data sets originating in BLM;" a move that would widen access, improve reliability, and realize one of the holy grails of digitization—interoperability. Lavoie (2004) describes interoperability as, "digital content [that] must be easily shared between services or users; usable without specialist tools; surfaced in a variety of environments; and supported by consistent methods for discovery and interaction." Standardization is one of the factors necessary to achieve interoperability, however it still doesn't account for "short media life, obsolete hardware and software, slow read times of old media, and defunct Web sites" (Chen, 2001, p. 2). Chen goes on to say the paradox of digital preservation is that, "we want to maintain digital information intact as it was created; on the other, we want to access this information dynamically and with the most advanced tools." Digital stewardship then must balance digital migration (the tendency of technology to rapidly change over time) with long term preservation policies. It is vital to assess frequency of mitigation, protections needed to prevent degradation, and media specific (film, audio, document, etc.) issues when developing a comprehensive technology policy. While it is difficult to foresee future digital mediums, digital crosswalks, interoperable systems, and human consortiums are working on solutions that seek to anticipate and even create new technologies that maximize preservation and access.

Preservation

Prior to digital stewardship, preservation often included restricting usage and just-in-time intervention—salvaging media from acidic fingerprints, UV rays, and improper storage. Preservation of digital media “will become less like an event occurring at discrete intervals, and more like a process, proceeding relatively continuously over time” (Lavoie, 2004). Preservation of an original item while reproducing an alternative copy of it—such as newspapers and microfilm—had been common practice prior to the digital revolution. While digitization, as Lavoie says, converts this practice to a more day-to-day routine rather than an “event” technological migration still has the potential to render digital media obsolete and virtually impossible to restore. Lavoie goes on to say that “Digital content often embodies a degree of structural complexity not found in physical materials.” This is where the policy becomes extremely important in outlining the expectations of the stakeholders and whether solutions for a temporary, finite period of time are acceptable.

To understand preservation, one must also understand the weight an agency carries to not only justify preservation, but provide transparency (especially public agencies), and maintain authority. “A true archive is a contextually based organic body of evidence, not a collection of miscellaneous information” (Hirtle, 2000, p. 10). With the advent of legislation like the Freedom of Information Act, it is in an agency’s best interest to provide comprehensive evidence of government or business activity. In the case of OPRD preservation of records and activities contributes to the agency’s authority, provides evidence of its actions to the public holding them accountable, and compiles organic histories which may be produced by the agency itself or contributed by members of the community and neighboring organizations which have a stake in that history. OPRD claims “to provide and protect” which implies that the preservation of “outstanding natural, scenic, cultural, historic and recreational sites” is also necessary “for the

enjoyment and education of present and future generations.” Left unpreserved, whether due to lack of staffing, knowledge, or policy, collections remain scattered, endangered, and cut off from their potential to become an educational tool. As previously defined by the ALCTS, “the goal of digital preservation is the accurate rendering of authenticated content over time” ensuring its use for generations to come.

It is in the interest of smaller governmental organizations such as OPRD to study what others in the industry are doing, adopting best practices and standards best suited to their unique situation. “In 2000, Congress asked the Library of Congress to lead the National Digital Information Infrastructure and Preservation Program to form a nationwide network of partners that will agree to collect and preserve our digital heritage” (<http://www.digitalpreservation.gov/library/presentation.html>). Institutions such as the Library of Congress (LOC) set the standards and provide support for smaller institutions around the country. At the LOC website (listed above) information is provided for the casual preservationist looking to protect family heirlooms and the serious archivist looking for tools and services to jumpstart a new preservation project. Academic libraries, with the benefit of federal funding and donor foundations, were among the first adopters of digitization. With the rise of internet use in 1997 public libraries began making moves to incorporate digitization into their preservation plans. A survey of public libraries serving a minimum of 50,000 patrons conducted the same year revealed that “the overwhelming response to the question of which materials would have first priority for digitization was photographic collections” (Liu, 2004, p. 339). In my initial work with the emerging archive collection at Silver Falls State Park, it was apparent that their photographic holdings were also in need of immediate intervention. The transparency of this need is found in user demand— anecdotal evidence from volunteers working in the Nature Store states that the public would like to see a history book of the area, as well as the images

documenting that history; the immediacy of re-housing—photographs were not organized, nor were they stored according to archival standards; and the necessity to establish partnerships with neighboring institutions that also claimed possession of photographic collections pertinent to park history. Part and parcel to digital preservation is to provide access to the material to a wider audience, increasing community investment, and establishing agencies such as OPRD part of that, “nationwide network of partners that will agree to collect and preserve our digital heritage.” Digital stewardship increases the amount of stakeholders in its holdings by nature of its structure, thereby increasing the support network to secure long-term persistence of primary interpretive media.

Access

While preservation is a vital component in digitization, the transient nature of digital formats destabilizes this end; however, “most digital projects [have] the ultimate aim of providing greater access to...collections, in order to contribute to education, awareness, and further research” (Liu, 2004, p. 340). While the paradox of keeping collections intact is complicated by keeping up with the latest methods of dissemination, migrating to the latest technologies is a great benefit to optimizing access. Adopting new modes of communication may be slowed by cost and readiness for conversion, however if “the ultimate aim” is providing greater access to collections then it is essential to keep up with how the public is accessing information.

During the 1930s, the Civilian Conservation Corps and the Works Progress Administration were responsible for creating park museums for the National Park Service, and they also contributed to the development of state parks. The first exhibits were created “by ranger-naturalists and park partners responding to the growing demand for nature exhibits by the visiting public” (Harmon, 2005, p. 427). The demand for exhibits continues today with a

significant portion of the visiting public made up of ethnic minorities and seniors (Merriman, 2004, p. 70). While conducting my independent study project at Silver Falls I have come across a number of historical photographs that have likely never been seen by the public. Creating a digital space accessible by the public would increase awareness about the park's history, provide educational opportunities in public schools, and improve research by local historians—all without the photographs ever having to be handled. Photographs transcend languages, and provide “old timers” an artifact of the past through which to interpret “the good old days.” Oral histories document local characters, connecting them to subsequent generations who have access to their stories. Park records provide a context for OPRD employees and other agencies to understand the motives behind past management practices and decisions. Access connects past to present and provides a wealth of information through which to competently make decisions affecting the future.

Access may also be used as a marketing tool to provide funding for the preservation of collections. Impressive wide scale digitization projects have produced such sites as The Internet Archive (1996), “a public non-profit organization with the goal of ensuring open, free, and permanent access to digital collections of historical and cultural artifacts” (Liu, 2004, p. 340). The Wayback Machine, one component of the Internet Archive, claims an attempt “to archive everything on the web by URL and by date, and to make it accessible to the public, no matter what the fate of the website” Started in 1996 and claimed to be the largest database in the world, it contains over 85 billion pages, possessing more data than the Library of Congress—whom acts as a partner. Access to digital exhibits may draw in additional visitors to the physical park and they may not, but in any case, the patron who is exposed to “digital collections of historical and cultural artifacts” has an awareness that did not exist before, and may occur without them ever leaving the comfort of their own home. The obstacle of physical distance used to serve as a

barrier to parks and recreation, but with the advent of the digital age the very notion of “recreation” has changed. Does recreation also encompass the act of surfing the net? Can OPRD provide the opportunity for digital recreation by making park collections accessible online?

Training

While this study will contribute to understanding to what extent Interpretive Rangers are trained to handle interpretive media, review of the literature reveals that archival and digital preservation training is not standard for the profession. It may also be determined that this in fact is not a primary duty of interpretation, however without a basic understanding of archival practices and trends as established and identified by the Society of American Archivists, interpreters employed by OPRD may be missing collaborative opportunities that could increase access and improve marketing of their respective programs. OPRD offers both a Basic Certification and a CORE interpretive training program. Six levels of interpretive certification are offered by the National Interpretive Association: Certified Interpretive Host, Certified Interpretive Guide, Certified Interpretive Trainer, Certified Heritage Interpreter, Certified Interpretive Planner, and Certified Interpretive Manager.

Considered the “father” of interpretation, Freeman Tilden authored *Interpreting Our Heritage* (2008) one of the profession’s standard texts. Tilden describes interpretation as “an educational activity which aims to reveal meanings and relationships through the use of original objects, firsthand experience, and by illustrative media rather than to simply communicate factual information.” These “original objects” must also be preserved and digitized in order for interpreters to keep up with visitor demands and ensure that objects will survive into future generations. In Michael Lesk’s *Understanding Digital Libraries* (2004) he devotes a chapter to both “User Needs” and “Collections and Preservations;” these would be excellent topics for an interpretive conference: digitization and the visitor, digitizing park collections, or emulation as

preservation. Two additional authors provide elaboration on the topic, William Arms' *Digital Libraries* (2001), and Ian Witten's *How to Build a Digital Library* (2002), although Lesk's would be the best choice to improve general understanding. While library science specializes in digitization, OPRD interpreters specialize in taking original and digitized media to the public and provoke them to consider what the object means; but without those initial preservation steps there will be no object with which to provoke. One of the texts which sits on the bookshelf in the Silver Falls interpretive office is *Environmental Interpretation: A Practical Guide for People with Big Ideas and Small Budgets* (Ham, 1993), and while it offers quick tips on preserving physical media (slides, photographs, and the like), warning against the damage of UV rays, dirt and improper temperature, there is no comprehensive discussion of preserving collections. In Lisa Brochu's *Interpretive Planning* (2007) a whole chapter is devoted to "Media" but only in the context of choosing, describing, and selecting cost effective media. Merriman & Brochu's *Management of Interpretive Sites: Developing Sustainable Operations through Effective Leadership* (2005) discusses "preserving program materials in operations" but more often in reference to exhibit design and maintenance. If interpretive texts begin discussing definitions of key terms in regards to digitization and argue the value of collaboration with local, state, and national library consortiums, park collections will be strengthened and additional fronts through which to market interpretive programs will be opened.

OPRD is blessed with "Friends" groups and volunteers that work on everything from grounds maintenance to working in Nature Stores. Volunteers, "if well-trained and mindful of their organization's mission, have an opportunity to help guests connect with the resource in meaningful ways that may promote stewardship of the resource" (Merriman, 2004, p. 66). Volunteers may also be utilized to assist with the digitization process, whether re-housing, scanning, or entering data. Before volunteers are recruited however it is vital for the Interpretive

Rangers to have a sound understanding of the process or be working with library science professionals on a digitization project. Authority control, the concept of maintaining consistency of subject headings and records in a system, is necessary to a viable digital collection. All contributors of data to a system must adhere to the same rules of punctuation, spelling, and metadata protocol; if not, catalog errors will run rampant and searchability will be drastically affected. Proper training of library science and interpretive professionals, volunteers and administration will contribute to the development of a valuable digital collection with the ultimate aim to “provide and protect” natural and cultural collections of original interpretive media.

Summary

This mixed methods study will examine policy and scope of existing OPRD park collections (if any), technological readiness of park employees and computer systems for digitization, existing preservation practices of physical and digital collections, access, and training. Defining a collection’s policy and scope is foundational to long-term protection and should expect rather than predict the possibility of digital migration. Despite the paradox of preserving media intact and providing access to it with the latest methods of dissemination, digital collections offer dynamic and interactive features that the interpretive profession could greatly benefit from. Digitization provides increased visibility, visitor access, and extensive networking opportunities with other parks, agencies, and libraries. Standard interpretive texts mention the importance of preserving interpretive media but do not go into great detail about it. Collaboration between library science professionals and interpretive professionals must occur in order to ensure authority control and proper handling of collections.

CHAPTER THREE: METHODS

Introduction

In order to determine to what extent selected employees of OPRD understand, implement, and collaborate on digitization projects an exploratory mixed-method (QUAL-quant) study was designed. The flexible nature of the three qualitative case studies by way of an open-ended interview will enliven the rigidity of quantitative data. Having been employed by OPRD myself for three seasons, possessing credentials in educational media, as well as working toward a Master's in Library Science has qualified me to design a study in which OPRD may benefit. While I do bring certain biases to the study, I am not an expert on digital preservation, and this study stands to educate me as much as it does OPRD. Purposive sampling accompanied by five criteria was used to select the participants, three of which will be used to develop a qualitative profile of three park units, and 50 participants (including the three qualitative participants) will contribute to the quantitative data. Three instruments, one qualitative and two quantitative, shall be used in the design. Replication of the design may occur for any company, government agency, historical society, or library seeking to gather data about digital preservation issues in that particular institution.

Statement of the Hypothesis

Based on my prior experience with the two graduate projects—Archives in the Park, and the continuation of the archives project in an Independent Study, both at Silver Falls—I developed a hypothesis that applies to all park units managed by OPRD. Interpretive rangers, interns, and managers who obtain higher scores on the aptitude test will be associated with parks who are further along in the development of park specific preservation plans and may have partially or fully developed digital collections. The primary research problem for this study is to determine to what extent interpretive rangers employed by OPRD understand, implement, and

collaborate on digitization projects in order to determine and advocate for future funding, training and collaboration with institutions that specialize in preservation and access.

Three core research questions formulate a core focus for the study:

- How does digitization fit into the OPRD mission?
- Are Interpretive Rangers provided with preservation training in order to care for original interpretive media collections?
- How often, and to what extent do Park Interpretive Programs collaborate with outside agencies on projects involving preservation and access? (Note on definitions: “outside agencies” shall be known as historical societies, museums, libraries, federal programs, etc.; according to SAA guidelines “preservation” shall be known in this case as management of collections; and “access” refers to the extent to which park collections are made available to the public via signs, exhibits,)

The fact that this study is limited to an Oregon governmental agency limits the generalizability of the study to some degree. The second delimitation is the type of agency being studied—parks and recreation. Comparative studies would have to be done in order to determine similar trends (if any) in other branches of government, museums, historical societies, corporate and special libraries, etc. A third limitation is the specificity of the job title in the participant group. Interpretive Rangers are not trained librarians or archivists; however due to their tendency to work with historical and fragile interpretive media this study serves to examine the potential of the group to become more proficient in this area and measure the receptivity of the agency as a whole to forge partnerships with those that are formally trained. A secondary hypothesis is that due to insufficient funding and staffing, these types of long-term partnerships with LIS professionals are not currently happening on an agency wide scale.

Rationale for Design

The rationale for using this exploratory mixed method (QUAL-quant) design is to allow one method to stand in for the deficiencies of the other. For example, if only qualitative data were collected on a single park unit, issues and trends may emerge which are unique only to that park and not generalizable to other park units within OPRD. On the other hand, relying solely on quantitative data would not allow for the documentation of the complexity of preservation and access issues which may emerge from the more open-ended and in-depth approach of qualitative methods. In the case of a QUAL-quant study, the three case studies conducted via interview will allow for the flexibility of the secondary, quantitative instruments. In other words, emerging themes may occur that may or may not be pertinent to other park units. These themes may then be distilled into survey questions and distributed to all parks, providing for a more complete picture of digital preservation in OPRD as a whole. Without this qualitative piece the quantitative instruments would be completely predetermined with no room for flexibility. The strength of the quantitative component in this study is that it will provide a baseline for improvement and serve as a pretest in the event of follow up studies conducted by OPRD or other interested parties as regards the agency's relationship to digital preservation. It should be noted that in the 2005-2007 action plan of the Oregon Heritage Commission, the seventh "action" was to, "Conduct a statewide survey of current heritage needs and publish results" (Oregon Parks and Recreation Department, 2005). This action was to support the larger goals of the Oregon Heritage Commission 2005-2011. Further research is needed to determine if a statewide survey was ever conducted.

Role of the Researcher

OPRD employed me as a seasonal ranger aide for three summers, and I am currently enrolled in an independent study with the SLIM program, which is a continuation of the *Archives*

in the Park project mentioned in the introduction of this proposal. These experiences have provided me with a general understanding of OPRD policies and procedures, but not necessarily as they relate to digital preservation. The park unit I am working with, Silver Falls, does not currently have a park specific preservation plan, although recommendations have been made to develop one. The inspiration for this entire study in fact, was born of my involvement in the two graduate projects. As a licensed teacher of Educational Media I also possess the ability to identify with interpretive rangers working with unique park collections in order to create educational programs for visitors, schools, and campers.

I am acquainted with one of the participants in the study, due to the graduate projects mentioned above; however I don't come to the table as the primary researcher with the expectation that OPRD staff know nothing about digital preservation and LIS professionals know everything. On the contrary, I believe both fields have valuable lessons to share with each other, for example, while LIS professionals, including archivists and museum curators usually have more experience dealing with the technological and organizational aspects of preservation and access, interpretive rangers have a unique outlook on repackaging. While I am coming from the bias of an LIS professional, and I predict that there will be disconnect between interpretive training and aptitude for the handling of archival and interpretive media, I do not expect that an experimenter bias effect will occur. If I have an agenda it is to demonstrate the need for increased funding, innovation, and collaborative effort in the realm of preserving and protecting park collections. One of the goals of the study (derived from the survey) is to identify what sort of collaborative efforts (if any) are occurring between OPRD and institutions that specialize in LIS and digitization. The role of the researcher in this case is to assess the prior knowledge of practicing interpretive rangers on digital preservation, and to objectively observe and record the experiences, shortfalls, and frustrations of three individual park interpretive programs as regards

their interpretive media collections. Ultimately it is up to OPRD what to do with this information; however it should also serve to inform the local LIS community how they might reach out to this particular agency. The only remaining bias I have is that I would like to be a part of future collaborative projects with OPRD as a representative of the LIS profession.

Participants

Purposive sampling (non-random) using a specific set of criteria was used to determine the participants of this study. Five criteria were used to select this sample: a) all participants are employed at least half time by OPRD, b) all participants regularly work with pre-existing interpretive media as defined by their work duties (“regular” interaction with interpretive media shall be defined as at least 30% of work related duties), c) all participants are required to produce innovative interpretive products as defined by their work related duties (creation of interpretive products composes at least 20% of work related duties), d) participants not meeting the requirements of the aforementioned criteria shall either be interpretive interns, employed seasonally, or managers of interns, involved in decision-making that effects park cultural and natural resource collections, e) all participants have been employed by OPRD for at least three years or three seasons.

Seventy out of 188 properties managed by OPRD provide interpretive services, 26 of those sites employ a full time interpretive ranger. Three of the 26 rangers will be interviewed using qualitative methodology; interpretive rangers from Silver Falls, Wallowa Lake and Sunset Bay State Parks will be interviewed. The three qualitative interviewees will be representative of three major geographic regions of Oregon: The Oregon Coast (Sunset Bay), The Willamette Valley (Silver Falls), and Eastern Oregon (Wallowa Lake). An aptitude test and survey will be sent to all 26 interpretive rangers as well as interns, managers, and staff associated with SHPO for a total of about 50 quantitative subjects, meeting the suggested sample size for quantitative

research. One of the questions on the survey will ask whether those subjects are a member of the National Association for Interpretation, a professional organization for interpretive rangers across the United States. It remains to be seen whether membership to NAI will have an effect on the study results. Updated annually, OPRD interpretive staff are supplied with an Interpreter's Manual, however it remains to be seen how much of the manual is devoted to instruction on preservation, organization, and management of Park collections, including current trends in the industry such as digitization. Accreditation and standards add credibility to the interpretive profession, as pointed out by Merriman & Brochu (2004, p. 69). During a recent Interpretive Core Training—the ninth annual training hosted by OPRD in 2008—57 Park employees obtained certification as basic level graduates, four earned an advanced certificate, while no staff have yet completed the final, master phase of the training. It remains to be seen whether level of training completed will affect the aptitude scores and influence survey data.

Instruments

In this exploratory mixed method (QUAL-quan) study three instruments will be used. The OPRD director, regional and park managers will all be contacted about the study and appropriate measures taken to acquire permission and gain entry to the three qualitative research sites. A confidentiality clause will be included with the informed consent as part of the quantitative survey will ask questions about financial information and designation areas of the OPRD budget.

The first instrument, a qualitative interview, will be conducted in three OPRD park units, serving as three mini case studies, using phenomenology to identify the nature of the relationship between participants and five predetermined themes of digital preservation: policy and scope, preservation, access, technology, and training. Additional themes may emerge as a result of the qualitative portion of the study, subsequently influencing the nature of the quantitative

instruments. The open ended interview will allow for participants to share their experiences relating to preservation and access. The interviews shall be conducted by the primary researcher.

The second and third instruments will be used in the quantitative part of the study—an aptitude test and a survey. The purpose of the general aptitude test is to assess prior knowledge and training of OPRD staff regarding digital preservation and archival standards. This instrument was developed by synthesizing pre-existing test questions designed by reputable institutions such as the Library of Congress, Society of American Archivists, and Cornell University. Content validity shall be determined by a panel of experts on digital preservation. The purpose of the survey is to accumulate data about available resources designated for digital preservation, attitudes regarding digitization, and information on collaborative partners and resources that may empower OPRD to develop both individual unit and agency-wide digital preservation plans as an amendment to existing heritage goals. Ideally the quantitative instruments would be hand delivered, but in the interest of time they may be mailed. Scores from the aptitude test and results of the survey will be tabulated by a team of three LIS professionals with a specialization in digital and archival preservation in addition to the primary researcher. Interjudge reliability will be determined by each “judge” scoring each of the tests and surveys. If significant discrepancies occur an additional scorer will be called in to measure the instruments or particular items producing the discrepancy.

With six years experience in the field of LIS, an initial teaching license in educational media, and a Master’s in Library Science pending I have the resources to construct the quantitative instruments derived from respected institutions such as the aforementioned Library of Congress. While not an expert in digitization I possess an understanding of divergent learning styles, which will be useful in conducting the qualitative interview, and Bloom’s taxonomy, which is a useful tool when considering how to compose test questions. The instruments

compiled and developed for this study will be scored and interpreted by a panel of three data analysts, two digital preservation experts, and myself.

Design and Procedure

The exploratory mixed-method (QUAL-quant) design of the study was chosen in order to fully examine the research problem and identify trends and issues unique to OPRD, but which may also be replicated in other Parks and Recreation Departments across the United States. The instruments are somewhat unique to the agency, but may be altered so that they are applicable, or generalizable to any company, government agency, historical society, or library seeking to gather data about digital preservation issues in that particular institution. The qualitative interviews should be conducted first followed by the quantitative instruments. Due to the exploratory nature of the study, a control group will not be used; however follow up studies on the same agency (OPRD) could lead to the development of a pretest-posttest control group design, or a posttest-only control group design. For example, interpretive rangers may be asked to re-take the aptitude test after additional training on digital preservation, the pre and posttest scores would then be compared. Potentially confounding variables for this study could be the failure of participants to return the quantitative test instruments, and while the aptitude test questions have been used before, the survey instrument was developed specifically for this study. Triangulation lends validity to the study, with the qualitative interview allowing for interpretive validity and the quantitative data contributing to descriptive validity by seeking facts in addition to perspectives. Finally, this study attempts to explain the current state of digital preservation within the context of OPRD in order to explore potential services and collaborative projects that could be forged in the future with local LIS and archival institutions.

Summary

Interpretive rangers, interns, and managers who obtain higher scores on the aptitude test will likely be engaged in digitization projects within their own park units. While SHPO provides leadership for historic preservation in the state of Oregon, this study contributes to their overall Historic Preservation Plan (2005), which outlines nine issues that are also key to this investigation: partnerships, advocacy, economic development, preservation and rehabilitation, identification and designation of resources, communication and networking, funding, education, and codes and ordinances. Whether or not the outcome of this study is that very few park units have individualized preservation plans and may or may not have fully developed digital collections, the study will clearly take the pulse of how far along OPRD is in actively working with SHPO to contribute to the goals and objectives of the Historic Preservation Plan. These nine goals are closely aligned to the five themes which emerged in the review of the literature: policy and scope, preservation, access, technology, and training. Similarities between interpreters and librarians also revealed itself in the literature, leading to the practicality of OPRD forging partnerships with those primarily specializing in the LIS profession. This exploratory mixed method (QUAL-quant) design allows one method to stand in for the deficiencies of the other. A metaphor if you will, for the collaborative potential between OPRD, SHPO, and agencies with an interest in digital preservation mentioned throughout this proposal. One reflexive qualitative instrument and two quantitative instruments will be used on a nonrandom sampling—appropriate due to the limitation of the study to study digitization only in the context of a single agency, OPRD. The aptly named interpretive validity of this study should be increased due to the experiences of the primary researcher, and the use of triangulation should further contribute to the accuracy of the resulting portrait of digital preservation in the Oregon Parks and Recreation Department.

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APPENDIX A: Participant Aptitude Test, Quantitative

Note: This instrument is not complete; these are examples of questions that will be included on the final test.

Test questions 1-4 borrowed from the *Library of Congress*, “Did You Know?” Quiz located at: <http://www.digitalpreservation.gov/you/didyouknow/index.html>

Test questions 5-10 borrowed from a tutorial developed by Cornell University and maintained by the Inter-University Consortium for Political and Social Research at the University of Michigan. <http://www.icpsr.umich.edu/dpm/dpm-eng/oldmedia/index.html>

1. True or False: Preserving your print and digital materials is very similar.

- True
 False

Answer: *False*

Digital is different. In many cases, digital materials are considered more fragile than physical ones. Machines and software used to read digital files can break or become obsolete. Also, the files themselves must be continually managed and their longevity is unpredictable. If you have any old floppy disks and no computer to read them, then you know what we mean.

2. True or False: The average life of a Web site is six months.

- True
 False

Answer: *False*

Hard to believe, but the average life of a Web site is between 44 and 100 days. The Web has revolutionized communications, making it possible for virtually anyone to become a publisher. Yet much of the material from the early days of the Web has vanished. For example, the national elections of 1994 were the first time in history that the Web played a major role. Yet those political Web sites are no longer available.

Fortunately, the Library of Congress has collected and preserved election Web sites since 2000, in addition to collecting Web sites from the September 11 tragedy and the Hurricane Katrina disaster.

3. How do you preserve a digital photograph?

- Save photographs in open, widely available formats, like .png, jpeg or tiff.

- Save multiple copies of your photographs on a variety of CDs, DVDs, or hard drives, and keep them in different locations.
- Transfer or migrate photographs to new formats and media as they become available.
- Print photographs with high-quality ink and paper.
- All of the above.

Answer: *All of the above*

Preserving something digital is not the same as preserving, say, a book or photograph. You can put a photo in a box and most likely look at it 50 years later. The same is not true with digital materials. If you do not actively preserve your family memories captured in digital text files or special events captured in digital photographs, they will likely be lost to future generations.

4. True or false: The Library of Congress has preserved more than 50 terabytes of digital files, the equivalent of 50 million books.

- True
- False

Answer: *True*

Much of today's knowledge and creativity is stored in digital formats. The preservation of this material is vital to your heritage. The Library of Congress has formed a growing network of preservation partners to help save digital information that would otherwise be lost. Web sites, geospatial data, digital images and digital TV are some examples of the more than 66 terabytes of digital files selected for preservation – the text equivalent of approximately 66 million books, as of July 2007.

5 The average interval between the introduction of new floppy disk size standards was:

- 5 years
- 10 years
- 15 years

Answer: *5 years*

The 8" floppy was introduced in 1971, followed by the 5 1/4" in 1976 and the 3 1/2" in 1981.

6 The best way to avoid catastrophic loss of digital storage media is:

- Print out all documents and store in fireproof cabinets
- Avoid touching media surfaces with bare hands

- Store a set of copies in a different location
- Maintain moderate temperature and humidity

Answer: *Store a set of copies*

If at all possible, off-site storage and data management should be arranged. The ideal off-site location is close enough to keep the cost of moving media back and forth from becoming prohibitive, while far enough away to minimize the likelihood that the main facility and off-site facility will succumb to the same disaster.

7 The following all represent a threat to data on optical media except:

- Excessive flexing
- Labeling the wrong side
- Stray magnetic fields
- High heat and humidity

Answer: *Stray magnetic fields*

True optical media (such as CDs and DVDs) do not use magnetism to store data and are thus unaffected by magnetic fields. Magneto-optical disks do store data magnetically, but the magnetic dipoles can only be altered at high temperatures (generated by a laser in a magneto-optical drive) and are not affected by stray magnetic fields at room temperature.

8 Obsolescence threatens (check all that apply):

- Computer operating systems
- Digital storage media
- Basic encoding schemes for digital data
- Hardware for reading digital storage media
- File formats
- Applications software
- Computing hardware

Answer: *All*

All technologies are subject to obsolescence.

9 The following are all trends in digital storage media except:

- Greater storage capacity
- Higher density
- Larger size
- Lower cost per unit of storage

Answer: *Larger size*

All major categories of storage media (magnetic disk, optical disk and tape cassettes/cartridges) have tended toward smaller size even while increasing total storage capacity, as a result of rapidly rising storage density.

10 What was the first medium for storing digital content?

- Paper
- Magnetic tape
- Floppy disks
- Hard drives

Answer: *Paper*

Punch tape was an early dead end in computer data storage. Punch Cards became obsolete as the cost of disk and tape storage dropped, and as users gained the ability to edit their work directly due to the development of interactive terminals. These early digital media were both machine-readable and eye-readable, thus forming a bridge between the analog and digital worlds. Subsequent digital media has been machine-readable only, allowing huge gains in processing speed, and space savings, but at the cost of total dependence on technology to interpret the contents.

Note: a. This instrument is not complete, these are example questions.
 b. Please refer to definitions at the end of the survey on those words which have an asterisk* next to them.

1. What Park Unit do you represent? _____

2. Please write in your job title _____

3. If you filled in “Interpretive Ranger” for #2:

What is the total number of years you have been one? _____

How many years have you been an Interpretive Ranger at your current Park Unit? _____

4. How much of the total park budget is designated for interpretation? \$ _____

5. How much of the interpretive budget is designated for preservation & management of interpretive media? \$ _____

6. Are you a member of the National Association for Interpretation? Yes No

7. Are you a member of any other professional organization? Yes No

If yes, please list: _____

8. Does the park budget allow for you to subscribe to scholarly journals? Yes No

9. If you answered “yes” to # 8, please list the journals your park subscribes to:

10. Do you personally subscribe to scholarly journals? Yes No

11. If you answered “yes” to # 10 please list the journals you personally subscribe to:

12. What degrees and certificates have you earned?

Please list: _____

13. Have you ever collaborated on an *interpretive project** with a local historical society, museum, library, education institute, etc.? Yes No

14. Have you ever collaborated on an interpretive project involving the preservation of *original interpretive media**? Yes No

15. Does your Park Unit manage its own archives or museum? Yes No

16. If you answered “yes” to # 14

a. What type of software (if any) do you use to catalog the collection?

Please state full name and version _____

b. If your collection is digital how long has it been so?

Please state # of years and/or months _____

17. If you answered “no” to # 14

a. Do you use an alternative hard copy system, such as a card catalog?

Yes No

If “yes” please describe _____

18. Have you ever received formal training/education on digitization of collections?

Yes No

19. If you answered “yes” to # 18:

a. What type of formal training did you receive?

Workshop or Seminar University/College course
 Certificate Other, please explain _____

20. If you answered “no” to #19:

a. What type of informal training did you receive?

Self taught Other, please explain _____
 Discussed the concept at several meetings
 Read about it I’ve never received any training at all

Interpretive Project – collaborative effort to produce secondary media (exhibits, signs, displays, etc.) from primary sources and original interpretive media (see below).

Original Interpretive Media – original documents, photographs, maps, objects, and collections unique to the park.

APPENDIX C: Sample Interview Questions, Qualitative

- 1) Can you describe your preservation, and archival education experience to date?
- 2) To what extent do you consider yourself a conservationist of cultural and historical materials significant to your park?
- 3) What does being an interpretive ranger mean to you?
- 4) What does technology mean to you?
- 5) How do your colleagues respond to collaborative efforts a) within OPRD and b) outside the agency? (i.e. partnerships with similar agencies such as BLM, or for-profit establishments such as contractors)
- 6) Provide some examples of your interpretive research process through the stages of a) first locating and accessing interpretive media, b) repackaging the media to fit the needs of your audience, and c) presenting interpretive media to the public through signs, exhibits, programs, etc.
- 7) What is your definition of preservation?
- 8) Describe your experience with digitization, whether a) accessing digital content yourself, or b) creating or contributing to the production of digital content.
- 9) In your opinion, how does digitization fit into the mission of OPRD? (if at all)
- 10) What, if anything, would you change about your job as an interpretive ranger?