PLANNING, DEVELOPING, AND EVALUATING eMUSEUMS: STEP-BY-STEP

HANDBOOK FOR MUSEUM PROFESSIONALS

by

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Honours B.A., University of Windsor, 1999

M.L.I.S., University of Western Ontario, 2001

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

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Abstract

The purpose of this study was to create a handbook that would support museum professionals through the stages of planning, creating, and evaluating a user-centered eMuseum. *Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Museum Professionals* was developed using the research and development methodology (R&D) developed by Borg and Gall (1989). The seven steps in the R&D cycle used in this study included: 1) research analysis and proof of concept, 2) product planning and design, 3) preliminary product development, 4) preliminary field testing, 5) revision of the prototype, 6) main field testing, and 7) revision of the final product. A prototype of the handbook was developed and then evaluated by experts in digital libraries or museum informatics in the preliminary field test. Revisions were made to the handbook based on their feedback. The handbook was then distributed to museum professionals for the main field test. Feedback from the main field test was used to create the final product.

Major conclusions from the study were:

1. There was a need for a handbook to guide museum professionals through the steps of developing an eMuseum. Museum leaders indicated a desire to create a stronger online presence for their museums, but did not know how to begin the process.

2. The handbook was most useful to museum professionals. Originally, the handbook was intended for an audience broadly defined as "information professionals", which included both library and museum professionals.

3. Museum leaders and community stakeholders could partner to create eMuseums. Stakeholders included educators who wanted to use eMuseums to incorporate standards-based curriculum into their classroom or graduate students in education looking for collaborative projects to advance their study.

4. Finding new ways to reach audiences was important to museum leaders. Museum leaders were aware that the majority of their visitors expected to find information about their museum on the Internet and wanted to find ways to reach these audience members.

5. Museum professionals found resources listed in the book to be useful. The handbook worked effectively as a reference guide for creating an eMuseum.

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CHAPTER 1 - Introduction to the Study

Introduction

The Negro Leagues Baseball Museum (NLBM) and Kansas State University (K-State) began their partnership in 1998. The Buck O'Neil Research and Education Center and Negro Leagues Baseball eMuseum (NLB eMuseum) were the most recent collaborative projects between the NLBM and K-State. The eMuseum was intended to specialize in providing primary and secondary source materials to teachers, students, and researchers interested in the rich social and cultural history of Negro Leagues Baseball. Like the NLB eMuseum, museums throughout the country had developed online presences. Some of these museums partnered with educators to extend their museums' reach to educational audiences. Many of these museum-education collaborations used new media to enhance their online presence. These new types of media defined themselves by "borrowing from, paying homage to, critiquing and refashioning their predecessors" (Bolter, 2001, p.24). While many of these museum and educator partnerships resulted in the creation of an online presence aimed at students and teachers, few were successful in recognizing the importance of contextualizing the collections, user-centeredness, interactivity, and using information management techniques to meet the needs of the user.

According to David Schaller from Eduweb, the "general public" does not exist and website creators need to closely research target audiences (Green, 2004). An important step in the process was to identify the targeted audience to determine how to best meet their information seeking needs. Creating a user-centered museum website involved making materials accessible by implementing user-defined hierarchies and providing users ease of navigation and access

(Jones, 2005). However, meeting the demands of users who wanted to access the collection was not as simple as just digitizing a collection and creating links from the museum's homepage. Ensuring that users' information seeking behaviors were successful in finding what they were looking for has been a complex task (Coburn & Baca, 2004). Information management, through indexing, cataloging, and digitizing resources, was a crucial process in making eMuseums easy for information seekers to use.

Traditionally, museums were concerned primarily about conserving, curating, and exhibiting works in permanent collections and special exhibits. Therefore, though the number of museums with websites was large, the number of museums that integrated information management functions into their organization was been relatively small (Hamma, 2004, p. 11). Sara Randall, who worked with ENCompass, one of the leading metasearch tools, reported on a recent initiative to provide more effective and responsive metasearch services to assist content providers (e.g. libraries) in delivering enhanced content (Green, 2004). According to Randall, museums were not represented in the metasearch movement to deliver enhanced content to users (Green, 2004). Typically, when museums approached a digitization project, the majority of resources went to the activities strictly related to creating digital images of collection objects, while activities such as creating additional content and contextual tools, building access points based on data standards and controlled vocabularies, and identifying audiences and their needs and behaviors were relegated to "phase two" or "we'll deal with that later" (Coburn & Baca, 2004).

Another area museums have explored as a means to providing greater access to their collections has been public access or kiosk systems. Until the last two decades, many museums offered selective information about their collections on a CD-ROM, which was made accessible

from a kiosk station within the museum itself. These CD-ROMs gave museums a product to sell, but updating the CD-ROMs to account for changes in attribution or to include new acquisitions was so costly as to be infeasible (Coburn & Baca, 2004). Using information management techniques to enhance eMuseums created the opportunity to change, update, and add additional information about the collection in dynamic ways, rather than producing CD-ROMs, which became quickly out of date (Coburn & Baca, 2004). One benefit to an information management based eMuseum was that, unlike traditional physical museums, eMuseums had unrestricted exhibition space. A second benefit was that patrons of eMuseums were not geographically restricted since anyone with an Internet connection could access a museum website.

These information management approaches towards creating an eMuseum, along with website design considerations, contributed greatly to improving the user's experience of the website. The design and spatial, as well as thematic, organization of the environment and collections created a narrative that conveyed the meaning of the subject matter to visitors (Bevan, 2005).

The organization and structure of the NLB eMuseum created by the partnership between the NLBM and KSU overcame gaps currently existing in online museums by implementing information management techniques. The NLB eMuseum recognized the importance of contextualizing the collections, user-centeredness, and interactivity. An example of how the NLB eMuseum implemented information management techniques was by making their online collection of videos browseable and searchable by keywords. Videos were indexed using a controlled vocabulary that allowed users to browse the video collection efficiently. The eMuseum contextualized its online collections by providing cross-references to key terms and concepts in the text that appeared throughout the website. For example, users reading about the

history of the Negro Leagues had the option to click on highlighted words in the text that would provide them with more information about a particular person or topic. Also, an interactive timeline allowed users to contextualize the stories and artifacts from the museum by explaining what was occurring in United States history during key eras of Negro Leagues Baseball history. By allowing information to be accessed in multiple formats, including text, audio, and video, the NLB eMuseum became user-centered because users were able to retrieve information in the format of their choice. Museums have yet to achieve what libraries and archives have been doing for decades to facilitate access to their holdings (Bevan, 2005).

Statement of the Problem

Increasing numbers of museums and educators partnered to extend their outreach by creating an online presence. Unfortunately, few of these partnerships made use of information management techniques by using metadata to effectively organize their curriculum materials and collections. Also, few of these online partnerships recognized the importance of contextualized collections, user-centeredness, interactivity, and the need to focus on a specific educational audience. The problem was that museum professionals and educators did not have access to a handbook that could guide them through the stages of planning, creating, and evaluating a user-centered eMuseum.

Purpose of the Study

The purpose of the study was to research, develop, test, and validate a handbook for planning, creating, and evaluating interactive, user-centered eMuseums that integrate information management.

Target Audience

The target audience for the handbook was museum professionals interested in partnering with community stakeholders, such as educational institutions or libraries, to create an online presence.

Research Questions

1. How could schools and museums partner effectively to create eMuseums that promoted creative teaching and learning?
2. What steps are involved in creating a user-centered eMuseum?

Significance of the Study

This research was an important contribution to the body of knowledge about museums and educational institutions partnering to create effective online presences. Several guides to building curriculum-based websites, museum websites, and digital libraries existed, but none of these guides integrated the key elements of each of these types of websites. For example, many curriculum-based websites promoted creative learning and teaching. Museum websites tended to focus on announcing upcoming events and, occasionally, featured digitized pieces from their collection. Digital libraries used information management, particularly in the form of metadata and cataloging, to provide users with access to their collections. The handbook resulting from this research incorporated the most useful elements of each of these types of websites to guide information leaders who wanted to create effective eMuseums.

Scope and Limitations

The purpose of this study was to create a step-by-step handbook for planning, creating, and evaluating eMuseums. The study included information about how museum professionals could partner with community stakeholders (e.g. schools, libraries, universities, etc.) to create eMuseums. Although the content of the handbook featured examples of museums partnering with schools to create eMuseums, the handbook did not address the development of lesson plans or other curriculum-related materials.

Organization of the Study

The organization of this study followed Borg and Gall's (1989) Research and Development (R & D) methodology for developing educational products. The study's organization was as follows:

Chapter One: Introduction to the Study. Chapter one included an introduction, statement of the problem, purpose of the study, research questions and objectives, definitions of terms, significance of the study, scope and limitations, organization of the study, and research methodology.

Chapter Two: Review of Literature. Chapter two consisted of a review of literature relating to online museums and digital libraries with an emphasis on interactive, user-centered online spaces for educators and students.

Chapter Three: Development and Validation of the Product. Chapter three described the process used to research, develop, field test, revise, and validate the handbook.

Chapter Four: The Validated Product*: Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Museum Professionals.* Chapter four contained the revised version of the stand-alone eMuseum development handbook.

Chapter Five: Summary. Chapter five summarized the conclusions and implications of the study, suggested usage of the eMuseum handbook, and made recommendations for further study.

Definition of Terms

Cataloging -- The process of creating entries for a catalog or database. In libraries, this usually includes bibliographic description, subject analysis, assignment of classification notation, and activities involved in physically preparing the item for the shelf, tasks usually performed under the supervision of a librarian trained as a cataloger (Reitz, 2004).

Conserving -- The use of physical or chemical methods to ensure the survival of manuscripts, books, and other documents, for example, the storage of materials under controlled environmental conditions or the treatment of mildew-infected paper with a chemical inhibitor (Reitz, 2004).

Contextualize -- In the most general sense, the entire situation, background, or environment relevant to an event, action, statement, work, etc (Reitz, 2004).

Controlled Vocabularies -- An established list of preferred terms from which a cataloger or indexer must select when assigning subject headings or descriptors in a bibliographic record, to

indicate the content of the work in a library catalog, index, or bibliographic database (Reitz, 2004).

Creative Teaching -- Creative teaching occurs when a teacher combines existing knowledge in some novel form to get useful results in terms of facilitating student learning. This may be either planned before the act of teaching, or invented as a response to the demands of the learning situation (Sale, 2005, p. 1).

Curate -- To care for and keep records of objects in a collection (Illinois State Museum, 2000).

Descriptive Metadata -- Descriptive metadata facilitates discovery, identification, and selection (Reitz, 2004).

Digital Libraries --A library in which a significant proportion of the resources are available in machine-readable format (as opposed to print or microform), accessible by means of computers. The digital content may be locally held or accessed remotely via computer networks (Reitz, 2004).

Digitization -- The process of converting data to digital format for processing by a computer. In information systems, digitization usually refers to the conversion of printed text or images (photographs, illustrations, maps, etc.) into binary signals using some kind of scanning device that enables the result to be displayed on a computer screen (Reitz, 2004).

Educators -- A person or organization with responsibility for developing, managing or delivering learning resources. This includes staff roles such as instructional designers, managers in educational institutions, learning technologist, teaching and learning support staff, and staff developers, as well as teachers (Barker, et al., 2003).

eMuseum (Virtual Museum) -- The concept of the Virtual Museum demonstrates how limitations imposed by the traditional method of organizing and presenting information can be overcome in the context of museum visits. In a nutshell, the Virtual Museum provides multiple levels, perspectives, and dimensions of information about a particular topic: it provides not only multimedia (print, visual images through photographs, illustrations or video, and audio), but, more important, it provides information that has not been filtered out through these traditional methods (Hoptman, 1992, p. 141).

Evaluation -- The systematic acquisition and assessment of information to provide useful feedback about some object (Trochim, 2005, ¶2).

Handbook -- A written or electronic resource with information such as models, processes, strategies or tools, which help leaders understand paradigms, events, or systems. It guides leaders through concepts and leads to successful implementation of programs (Pownell, 2002, p. 27).

Index -- An alphabetically arranged list of headings consisting of the personal names, places, and subjects treated in a written work, with page numbers to refer the reader to the point in the text at which information pertaining to the heading is found (Reitz, 2004).

Indexing -- The process of compiling one or more indexes for a single publication, such as a monograph or multivolume reference work, or adding entries for new documents to an open-end index covering a particular publication format (*example*: newspapers), works of a specific literary form (biography, book reviews, etc.), or the literature of an academic field, discipline, or group of disciplines (Reitz, 2004).

Information Management -- The skillful exercise of control over the acquisition, organization, storage, security, retrieval, and dissemination of the information resources essential to the successful operation of a business, agency, organization, or institution, including documentation, records management, and technical infrastructure (Reitz, 2004).

Information Leader – See Information Professional

Information Professional -- An Information Professional ("IP") strategically uses information in his/her job to advance the mission of the organization. This is accomplished through the development, deployment, and management of information resources and services. The IP harnesses technology as a critical tool to accomplish goals. IPs include, but are not limited to, librarians, knowledge managers, museum curators, chief information officers, web developers, information brokers, and consultants (Special Libraries Association, 2004, ¶1).

Interactivity -- A computer interface designed to respond to input from a human being, usually in the form of commands and/or data. A back-and-forth dialogue between a computer program

and its human user is an *interactive session*. Highly interactive systems, such as computer games, are designed to anticipate the user's needs, instead of responding in a prescribed way. Once started, a program that is *not* interactive proceeds without further human input (Reitz, 2004).

Internet -- The high-speed fiber-optic network of networks that uses TCP/IP protocols to interconnect computer networks around the world, enabling users to communicate via e-mail, transfer data and program files via FTP, find information on the World Wide Web, and access remote computer systems such as online catalogs and electronic databases easily and effortlessly, using an innovative technique called packet switching. The Internet began in 1969 as ARPAnet, a project of the U.S. Department of Defense. It now has hundreds of millions of regular users worldwide (Reitz, 2004).

Kiosk -- An electronic device that provides information (via a display), is interactive in nature (a multimedia combination), and allows for input (via an input device such as a touch screen or a keyboard). The kiosk is unique from a standard pc as it is created for a specific user and specific purpose and is owned, controlled, and operated by the deployer (d3 Magazine, 2004).

Metadata -- Structured information used to describe information resources/objects for a variety of purposes. Although *AACR2*/MARC cataloging is formally metadata, the term is generally used in the library community for nontraditional schemes such as the Dublin Core Metadata Element Set, the VRA Core Categories, or the Encoded Archival Description (EAD). Metadata can be categorized as descriptive, structural, and administrative (Reitz, 2004).

Metasearch -- A search for information using software designed to optimize retrieval by querying multiple Web search engines and combining the results (Reitz, 2004).

New Media -- Using digital media and computer technology to create innovative and interactive instructional and presentation materials for delivery via CD, DVD and the Internet (Center for Media Production, 2004, ¶1).

Online Museum -- see eMuseum

Planning -- The process of anticipating future occurrences and problems, exploring their probable impact, and detailing policies, goals, objectives, and strategies to solve the problems. This often includes preparing options documents, considering alternatives, and issuing final plans (United States Bureau of Justice Assistance, 2005).

Primary Source Materials -- In scholarship, a document or record containing firsthand information or original data on a topic, used in preparing a derivative work. Primary sources include original manuscripts, periodical articles reporting original research or thought, diaries, memoirs, letters, journals, photographs, drawings, posters, film footage, sheet music, songs, interviews, government documents, public records, eyewitness accounts, newspaper clippings, etc (Reitz, 2004).

Profiles -- A demographic study of the community served by a library or library system, or of its registered users or user group, for the purpose of measuring economic, social, and educational

variables pertinent to the development of collections, services, and programs and to the design of

new facilities. A profile is usually conducted with the aid of a survey instrument but may also

include data compiled from other sources (Reitz, 2004).

Research -- Systematic, painstaking investigation of a topic, or in a field of study, often

employing hypothesis and experimentation, undertaken by a person intent on revealing new

facts, theories, or principles, or determining the current state of knowledge of the subject (Reitz,

2004).

Secondary Source Material -- Any published or unpublished work that is one step removed

from the original source, usually describing, summarizing, analyzing, evaluating, derived from,

or based on primary source materials, for example, a review, critical analysis, second-person

account, or biographical or historical study (Reitz, 2004).

Standards -- Refers to any code of rules or procedures established by national and international

library organizations to govern bibliographic control, such as the MARC record format, CIP, and

the ISBN/ISSN adopted by the publishing industry (Reitz, 2004).

Usability Assessment -- A variety of techniques for measuring or comparing the ease with

which a computer system or interface, such as an online catalog or website, meets the needs of

its users, including focus groups, surveys, direct observation of actual search behavior,

exploratory activities in which volunteers are asked to organize categories of information or

work with a prototype, comparison with existing guidelines and bench marks, and formal or informal testing (Reitz, 2004).

User-Centeredness -- A design approach in which the emphasis is on the user and through which a high level of usability is achieved (The Usability Company, 2005).

Website -- A group of related, interlinked webpages installed on a web server and accessible 24 hours a day to Internet users equipped with browser software. Most websites are created to represent the online presence of a company, organization, or institution or are the work of a group or individual. The main page or welcome screen, called the homepage, usually displays the title of the site, the name of the person (or persons) responsible for creating and maintaining it, and date of last update (Reitz, 2004).

Summary

The purpose of this study was to research, develop, and validate a handbook for museum professional to partner to plan, create, and evaluate eMuseums. The problem was that museum professionals did not have access to a handbook that could guide them through the stages of planning, creating, and evaluating an eMuseum. The dissertation resulted in a completed product that offered museum professionals the information and instruction they needed to develop an eMuseum.

CHAPTER 2 - Review of the Literature

Introduction

A review of the literature relevant to this study began in the spring of 2005 and continued through the fall of 2006 when writing of the handbook for this study began. During the handbook's preliminary and main field tests, additional sources were reviewed to find the most recent research available on the topics included in the handbook. The literature reviews conducted included research of books, journals, conference proceedings, personal interviews, and websites.

Several subject areas related to eMuseums were reviewed while researching, developing, and validating the handbook produced in this study. The review of the literature focused on the subjects essential to determining the need for the product produced in the study. These subjects were organized into the following five areas: (a) evolution of the eMuseum, (b) need for eMuseums, (c) challenges for small museums, (d) need for partnerships, and (e) format and content of materials for guiding small museums.

Evolution of the eMuseum

To understand an eMuseum, the concept of a museum must be defined. The International Council of Museums (ICOM) defined a museum as:

> A non-profit making, permanent institution in the service of society and of its development, and open to the public, which acquires, conserves, researches, communicates and exhibits, for purposes of study, education and enjoyment, material evidence of people and their environment". (2005, ¶1)

In a recent journal article, Rennie and Johnson broadly defined a museum as "any institution, built, or interpreted environment that may have an educational role, whether education is part of its mission statement or not" (2004, S4). In his 1930 article, Paul Rea described the functions of museums as "the acquisition and preservation of objects, the advancement of knowledge by the study of objects, and the diffusion of knowledge for the enrichment of the life of the people" (265). Though this description of the functions of museums was written nearly eighty years ago, the mission of museums remained the same, only the methods had changed by which museums could diffuse knowledge to the public. Increasing use of the Internet as an interactive communication tool has contributed to the development of new ways for museums to share information with their public. Museums were no longer limited to physical spaces. In addition to these physical spaces, museums have been able to meet their missions to provide service to society by preserving objects and diffusing knowledge electronically via the web.

The first webpages emerged in the early 1990s. At that time, email and the Internet were just beginning to become well known, however, the web had its start among physicists in 1991 (Cohen & Rosenzweig, 2006, p. 19). The web moved into the mainstream in 1993 when the National Center for Supercomputing Applications (NCSA) at the University of Illinois released Mosaic, an easy-to-use graphical web browser that ran on most standard computers. Between mid-1993 and mid-1995, the number of servers – the computers that housed websites – jumped from 130 to 22,000 (Cohen & Rosenzweig, 2006, 19). In October 1994, Marc Andreessen and some of his colleagues who had developed Mosaic at NCSA released the first version of a commercially funded browser called Netscape. Also in 1994, Nicolas Pioch, a computer science instructor at the Ecole Nationale Superieure des Telecommunications in Paris, launched the Web

Museum, which soon became an online archive of several thousand works of art (Cohen & Rosenzweig, 2006, p. 21). Pioch was among the first to develop an online museum and since then, many other institutions have followed suit. Museums with an online presence had the potential to vastly increase their audience reach. In September, 2006 there were 1,086,250,903 Internet users in the world with 229,138,706 originating from North America (Internet World Statistics, 2006). Internet World Statistics defined an internet user as anyone currently in capacity to use the Internet because they had access to an Internet connection and the basic knowledge required to use Web technology. Clearly, the number of potential museum visitors who could be reached via the web was increasing.

The creation of online museums, or eMuseums, has enabled museums to reach audiences that would have previously been impossible to reach. By creating an eMuseum, museums have made their collections accessible online. Online accessibility meant that records could be open to people who rarely had access before. For example, the reading rooms at the Library of Congress had never welcomed high school students. Now the library's American Memory website allowed high school students to enter the virtual archive on the same terms of access as the most senior historian or member of Congress (Cohen & Rosenzweig, 2006, p. 4). American Memory succeeded because it exploited two intrinsic advantages of the digital medium: accessibility and searchability (Cohen & Rosenzweig, 2006, p. 27). Online collections were accessible to anyone with an Internet connection. Since collections like those featured on the American Memory website were searchable electronically, both novice and professional researchers could find information quickly within collections that previously took scholars hours to find by searching the text line by line.

The early success of American Memory and other pioneering web archives inspired hundreds of other libraries, archives, and museums to present their collections online. The Library of Congress played an important early role in spreading digital archives in the United States. With a $2 million grant from Ameritech, the library sponsored a competition from 1996 through 1999 that enabled museums, historical societies, archives, and other libraries to create digital collections of primary resources (Cohen & Rosenzweig, 2006, p. 27). Soon additional funding sources brought dozens of major collections online.

Need for eMuseums

A recent report from the Museums Association indicated that museums should be doing more to expand opportunities for people to engage with their collections (2005). The Museums Association recognized that development of eMuseums would be helpful for museums who have sought to extend the reach of their collections. The large size of many museum collections compared to the size of their physical display space meant that most of the items museums contained could never be displayed. Museum staff members reported that they were often exasperated by demands from funders and politicians that more of their collections should be put on display (Museums Association, 2005, p. 11). Museums have been in a situation to utilize new technologies to make offering access to collections easier. These same technologies have made it possible for museums to offer multiple perspectives on their materials. Through hypertext linking, eMuseums have provided online patrons the opportunity to fully explore the information available about an item in the collection. As technology became less expensive and more accessible, museums were able to offer visitors a variety of pathways to their collections. Scholarly, public, and popular historians who have researched collections online have repeatedly

confirmed the Library of Congress's early discovery that the web could reach unprecedented numbers of users (Cohen & Rosenzweig, 2006, p. 44).

Online museum exhibits had the potential to transcend barriers of time (most exhibits were temporary installations), distance, and space (gallery space was limited) that often frustrated museum curators. Physical exhibits translated to the web because of their combination of text and images (Cohen & Rosenzweig, 2006, p. 35). Some online exhibits incorporated additional features that physical exhibits could not offer. The web has provided museums with new ways of interacting with its public. Examples of these new ways of interacting with the public have included the building of interactive communities who contributed to the exhibits. For instance, an online exhibit depicting the chaos and destruction in New York City on September 11, 2001 could feature a section where those impacted by 9/11 could share their stories. Interactive features such as these allowed eMuseums to not only disseminate knowledge, but to build communities of users. However, done poorly, such interactive features on a website seemed unprofessional. Done well, these additional web features have engaged users.

According to the Museums Association report, museums needed to continue to digitize their collections and the information that accompanied their collections (2005). Researchers and Internet users have increasingly expected to find historical resources available online. The Museum Associations predicted that there would be uses of digitized collections that have not been imagined yet. Museums of the future would use the digital resources created today for their own ends, just as museums today used the buildings and collections established in the past for their own purposes. Continued investment in digitization has been vital and should not be held back by skepticism about the quality of some of the products that have been used to digitize collections (Museums Association, 2005, p. 14).

During their research, the Museums Association found that too many museum collections had been underused by being not displayed, published, used for research or even understood by the institutions that cared for them (Museums Association, 2005, p. 4). The point has been made clear that displays were no longer been the most relevant way of presenting all of a museum's collections, nor have displays been adequate to encompass the volume of materials that museums hold. Yet, permanent or temporary displays have been the primary form of engagement with collections in most museums (Museum Association, 2005, p. 11). Museums who have developed an online presence have better realized the potential of their collections by giving more people more opportunities to engage with collections, by releasing information and generating knowledge, and increasing virtual access to collections (Museums Association, 2005, p. 9).

Arguments that have enthusiastically promoted the widespread implementation of educational computing predicted that these technologies would facilitate and transform the teaching process, and promote significant gains, both academic and vocational, for students (de Castell, Bryson & Jenson, 2002). In 2000, the Digital Cultural Heritage Community Project (DCHC), funded by the Institute of Museum and Library Services, sought to develop, document, and disseminate both the processes and products of a model program of cooperation between museums, libraries, archives and schools, thereby demonstrating how access to innovative technological resources could enhance educational programs (Bennett & Sandore, 2001). The DCHC was developed based on the concept of a digital community where institutions would contribute to a database of images, text, other multimedia objects, and descriptive information that addressed common themes (Bennett, Sandore & Pianfetti, 2002). They expected that this would enable teachers to use the database to engage students through lesson plans. Selection of content for the database was determined based on the curriculum units, the corresponding

learning standards and subsequent discussions with the museum curators, archivists and librarians. Through online discussions, the teachers became more familiar with the collections available. Additionally, the curators and librarians became much more aware of what types of artifacts and documents the teachers would find most useful in their classroom presentations (Bennett, Sandore & Pianfetti, 2002). The DCHC project demonstrated the effectiveness of museums, libraries, and schools collaborating to create an online presence.

Museums, schools, and libraries should not let technology dictate how they will use technology to reach their audiences. Instead, they should think about their educational needs and how technology can help them meet those needs. One way of rethinking the purposes and uses of new technologies for education has been to reposition common theoretical questions, asking not how education might use these new tools, but instead asking what, educationally, they might offer (de Castell, Bryson & Jenson, 2002). Instead of theorizing educational technology, the focus becomes the educational theory of technology.

Challenges for Small Museums

Increasing numbers of visitors to museum websites have pressured museums to provide more choice, easier access, and more useful information than ever before (Davis, 2005). Major museums such as the Smithsonian have turned their website design over to professional firms such as Second Story, which gave their exhibits a professional feel. Smaller museums and history focused websites generally had the homemade look of less well-off relations (Cohen & Rosenzweig, 2006, p. 37). Without the funding available to large museums like the Smithsonian, small museums were left frequently to their own limited devices for developing an online presence. Consequently, it has been a challenge for small museums to find the skills and resources needed to make their collections available online. Also, when museum professionals

were involved in the design and development of museum websites, designers risked creating websites that used organizational schemes and vocabularies unfamiliar to non-museum professionals (Marty & Twidale, 2004)

Museums that have been able to make some of their collections available online have not necessarily been successful in meeting the information seeking needs of their online users. Traditionally, museums have been concerned primarily about conserving, curating, and exhibiting works in permanent collections and special exhibits. Typically, when museums approached a digitization project, the majority of resources went to the activities strictly related to creating digital images of collection objects, while activities such as creating additional content and contextual tools, building access points based on data standards and controlled vocabularies, and identifying audiences and their needs and behaviors were relegated to "phase two" or "we'll deal with that later" (Coburn & Baca, 2004). Therefore, though the number of museums with websites has been large, the number of museums that have integrated information management functions into their organization has been relatively small (Green, 2004; Hamma, 2004). Information management functions included using metadata standards and controlled vocabulary to describe pieces of the collection. Metadata is the structured information used to describe information resources or objects. Metadata could be categorized as descriptive, structural, and administrative (Reitz, 2004). Descriptive metadata included information that describes the content of an item, such as the title, author, publisher, subject, and physical dimensions. Structural metadata described the internal structure of an item including page, section, or chapter numbering, indexes, and table of contents. For example, structural metadata might have included identifying an oral history video interview with Buck O'Neil as "Part V in the Negro Leagues Baseball Oral History Project". Administrative metadata managed access to

the item. This could have included information on how the item was scanned, its storage format, or any information necessary for the long-term preservation of the object. Without metadata, browsing and searching online collections became difficult, if not impossible, for users.

Museums who wanted to create online museums have encountered many difficult questions including who should create metadata, whether central editorial control of metadata was required, and how the process should be managed (Dawson, 2004, p. 137). Meeting the demands of users who wanted to access the collection was not as simple as just digitizing a collection and creating links from the museum's homepage. Ensuring that users' information seeking behaviors were successful in finding what they were looking for has been a complex task and museums have yet to achieve what libraries and archives have been doing for decades to facilitate access to their holdings (Bevan, 2005; Coburn & Baca, 2004; Marty & Twidale, 2004). Websites focusing on a specific historical topic have been among the weakest types of websites because they sometimes lacked focus and became a hodgepodge of materials centered on a particular theme (Cohen & Rosenzweig, 2006, p. 48).

For professionals in museums who have begun thinking about developing an online presence, copyright has been a massive issue. Understanding the legal issues has been important, but not being impeded by unnecessary legal detail or worried by improbable scenarios has been equally important (Dawson, 2004, p. 139). Museums have been forced to make decisions between making materials accessible and following copyright law, often without the help of those with copyright expertise.

Another challenge for museum professionals has been acquiring a sufficient understanding the costs involved in creating an eMuseum. The total costs of making a museum collection accessible online have not always been obvious. When planning the creation of an

eMuseum, focus tended to be on the literal costs of moving documents into digital form, such as paying someone to type a handwritten document or employing a student to operate a scanner. There have been other crucial and expensive parts of the process, especially preparing and selecting the materials to be digitized and assembling metadata about the materials. Roughly, one-third of the costs in digitization projects stemmed from actually digital conversion; an equal third went towards cataloging and descriptive metadata and the final third was spent on administrative costs, overhead, and quality control (Cohen & Rosenzweig, 2006; Collaborative Digitization Program, 2006; Lesk, 2004; Puglia, 1999). Without the staff, expertise, and resources available to large museums, small museums have been left alone to face the challenges involved in developing an online collection.

Need for Partnerships

Partnerships between museums and higher education have been far less developed than they could be (Museums Association, 2005, p. 6). Enhancing the research culture in museums has required multiple solutions. Museums have needed to promote their collections to potential researchers, and arguably this is a role that has been less well developed in museums than in libraries and archives (Museums Association, 2005, p. 13). Museums needed to do more to establish partnerships with higher education and be recognized as places where different users can carry out research at different levels.

There were reasons for why the partnerships between museums and higher education have been far less developed than they could be. The approach taken to particular subjects by museums and by universities has differed significantly. Research carried out in museums and presented in the form of exhibitions and catalogs have been undervalued by universities' administration, thereby discouraging them from investing resources in museum projects

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(Museums Association, 2005, p. 27). Nevertheless, higher education has had resources available

that were worth the pursuit of museums; especially since higher education had a history of being

a source of funding for museums projects (Cohen & Rosenzweig, 2006). According to the report

from the Museums Association, museums should pool their resources by working across

institutional boundaries, to begin addressing the shortfall of expertise, and find ways of making

better use of under-used collections. Groups of museums who have worked together have been in

a desirable situation to draw in external expertise from higher education, industry, and

enthusiasts' groups. Libraries and educators had their own reasons for wanting to partner with

museums. Bennett, Sandore, and Pianfetti found that teachers were attracted to collaborating

with museums and libraries because of the opportunity to match mandated state learning

standards with classroom activities. Curators and librarians indicated they were motivated to

collaborate because such projects provided them with the impetus to do a number of things they

considered institutional priorities but had been unfunded mandates including, focusing on a

community outreach program, forming new partnerships with previously un-served or

underserved groups, and identifying and assessing collections for digitization (Bennett, Sandore,

Pianfetti, 2002).

Format and Content of Materials for Guiding Small Museums

Those embarking on creating eMuseums should keep in mind existing standards and best

practices to guide them in the process. Community agreement on best practices was important in

helping make collections of digital materials more interoperable and sustainable (Besser, 2002).

Best practices assured that content and metadata from different collections would meet minimum

standards for preservation purposes, and that users could expect a baseline quality level (Besser,

2002). There were many handbooks and articles available to guide eMuseum developers who

wanted to focus on metadata schemes and how to use them for an online collection. However, there have not been any guides that addressed the multifaceted needs of museum professionals who wanted to develop an eMuseum.

When it came to designing the eMuseum interface, the multitude of interface design options available made offering guidelines in a short space impossible (Dawson, 2004, p. 135). Several web design handbooks were available that guided website developers on best practices for developing websites. Some of these web design guides focused on developing online libraries, but no guides existed that addressed the needs of museum professionals who wanted to develop an eMuseum that integrated some of the attributes of library websites and curriculum websites, while maintaining their own unique museum-related characteristics.

Conclusion

There was a significant gap in the materials available to guide small museums through the steps of building an eMuseum. Several guides existed for building curriculum-based websites, museum websites, and digital libraries, but none of these guides integrated the key elements of each of these types of websites (Chen & Magoulas, 2005; Collaborative Digitization Program, 2006; Kalfatovic, 2002). For example, many curriculum-based websites tried to promote creative learning and teaching. Museum websites tended to focus on announcing upcoming events and, occasionally, featured digitized pieces from their collection. Digital libraries used information management, particularly in the form of metadata and cataloging, to provide users with access to their collections. Yet, there were no guides available that incorporated the most useful elements of each of these types of websites to guide information leaders who wanted to develop effective eMuseums.

CHAPTER 3 - Research Methodology

Introduction

To determine what would be included in *Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Museum Professionals*, several specific research objectives were identified. These objectives helped guide the research to determine what was included in the final product. The specific research objectives were: (a) examine the literature to determine currently existing practices in developing user-centered eMuseums; (b) determine how information management practices can contribute to creating eMuseums; (c) develop a model for museum leaders to use in the creation of an eMuseum; and (d) create a handbook for museum leaders to use as a resource in partnering with community stakeholders to build an eMuseum.

The research design of this study followed the educational Research and Development (R & D) methodology outlined by Borg and Gall (1989; Gall, Borg, & Gall, 1996) as well as formative evaluation by Dick and Carey (1985, 1990). The process of developing a handbook through an R & D dissertation must be validated in a number of ways. Therefore, the requirements for each step of the R & D process were followed carefully. This section outlines the seven-step development cycle which was used in this study (see Figure 1).

According to Borg and Gall (1989), educational R & D methodology has its origins in industry where products are developed through a process that tests and refines products. Educational R & D products follow a process of field-testing, evaluation, and refinement for producing functional educational products and programs. The development of a handbook for creating eMuseums was feasible using the R & D process.

The R & D process for developing a handbook for creating eMuseums included the following steps: (1) proof of concept; (2) product planning and design; (3) preliminary product development; (4) preliminary field testing; (5) prototype revision; (6) main field testing; and (7) final product revision and dissemination (Borg & Gall, 1989). Borg and Gall's model included additional steps consisting of operational product revision and operational field testing. These additional steps were not used in this study because of time and budget restraints inherent to graduate research.

As illustrated in Figure 1, the R & D process is not always linear. It is possible that results of the preliminary field test or the main field test would require the researcher return to an earlier step in the process. In this situation, the researcher would return to an earlier step in the process and then follow subsequent steps until the product was validated.

Figure 1. Model for the Seven-Step R&D Process
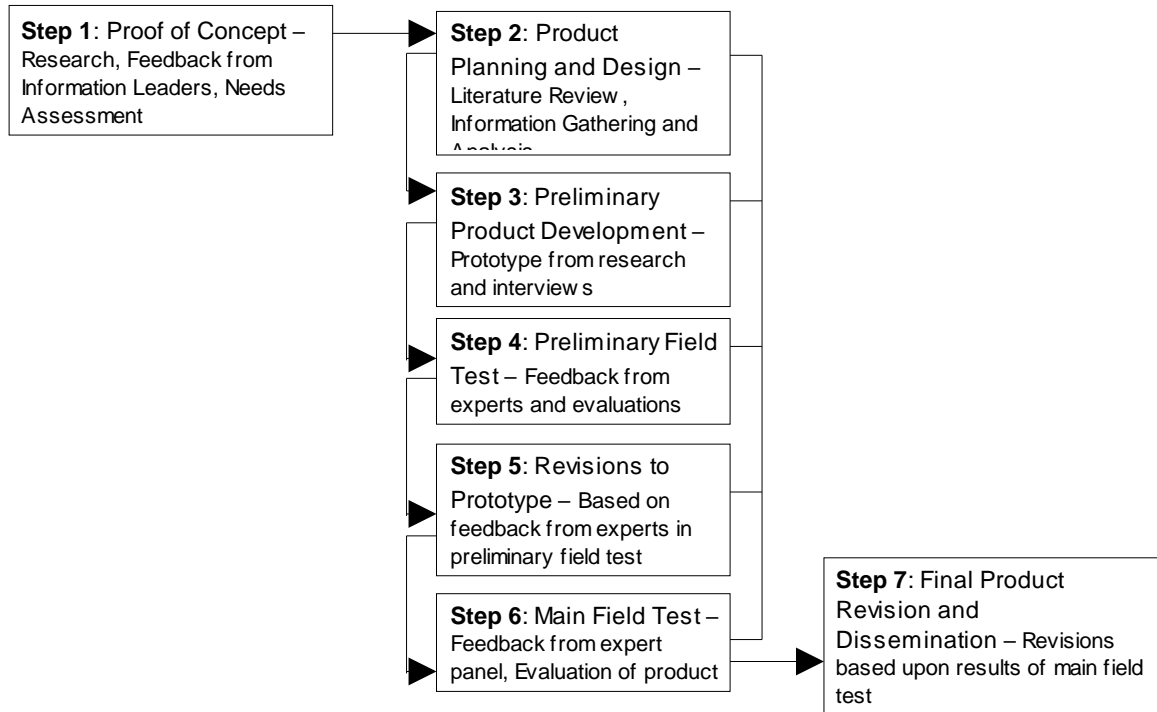
The timeline for completion of the research is illustrated in Table 1.

Table 1. Major events and timeline.

Event/Step	Timeline
Proposal approved by committee	April 24, 2006
Proof of concept	June, 2006
Review of the literature	January, 2006 – August, 2006
Development of the handbook	September, 2006 – June, 2007
Preliminary field test	June, 2007 – July, 2007
Revision of the product	August, 2007 – October, 2007
Main field test	November, 2007 – December, 2007
Revision of the product	December 2007 – January, 2008
Research presented to committee	April 23, 2007

Research Analysis and Proof of Concept

The proof of concept for the eMuseum handbook included the collection of information, a thorough literature review, and oral interviews with three museum and/or digital information leaders drawn from a pool of identified experts. These experts were identified with the assistance of members of the Digital Initiatives Department at Kansas State University and members of the Kansas City Museum Educators Roundtable. Three experts were selected who had nationally recognized reputations for their publications and/or national conference presentations in the areas of digital libraries, museum informatics, and/or museum education. Proof of concept experts included Mr. David Allen, Mr. Kenning Arlitsch**,** and Mr. Matt Veatch.

Table 2. Proof of concept experts.

Name	Qualifications
Mr. Kenning Arlitsch	1. Associate Director for Administrative and IT Services at the Marriott Library, University of

	Utah.
	2. From 2000-2004 built the Marriott's digital library program, founded the multi-state Mountain West Digital Library, the Utah Digital Newspapers program, and worked with the Greater Western Library Alliance to launch the Western Waters Digital Library.
	3. Nationally renowned speaker and publisher of multiple peer reviewed articles about developing digital collections.
Mr. David Allen	1. Digital Initiative Department Head at Hale Library, Kansas State University.
	2. Presented nationally about developing digital collections.
	3. Directed the development of a prototype Kansas Digital Library (KDL), a digital library of uniquely Kansas content.
Mr. Matt Veatch	1. Assistant Director of Library and Archives Division at the Kansas State Historical Society.
	2. Led development of Territorial Kansas Online.
	3. Presented nationally about developing digital archives.

The proof of concept returned the following information: a) teachers and students had a need to use eMuseums to engage in curriculum materials that incorporated primary sources and met curriculum standards; b) small museums needed instructional materials describing the process of planning, creating, and evaluating an eMuseums; and c) the proposed handbook would especially help people creating eMuseums for the first time.

Product Planning and Design

The product planning and design process involved analyzing information gathered from an extensive review of the literature, and the reactions and feedback received from experts in the proof of concept interviews. Since handbooks for creating eMuseums did not exist, learning materials developed for digital information and museum leaders in other technology-related areas were consulted during the planning and design of the eMuseum handbook. During this

process, the target audience was specified to be information leaders interested in collaborating with community stakeholders to create an eMuseum. Information leaders included museum curators and directors, educators, librarians, archivists, and other information professionals. The handbook's primary objective was to be a resource to guide information leaders through the stages of planning, creating, and evaluating a user-centered eMuseum. A specific plan for the evaluation of the handbook was determined as questionnaires were finalized.

Preliminary Product Development

A prototype of *Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Information Professionals* was developed. The design of the prototype was based on the literature review, other resource handbook observations, and expert interviews. The handbook used examples taken from the process of creating the Negro Leagues Baseball eMuseum as part of a partnership with Kansas State University. A model for developing an eMuseum was created and each chapter of the handbook dealt with a step in the eMuseum development model. Chapter one began with defining an eMuseum. By understanding what an eMuseum was, readers could determine if an eMuseum would benefit their organization. Chapter two explained the value of external partnerships and ways museums could collaborate with outside organizations. Chapter three discussed how to identify audiences and target the eMuseum to specific audiences. Chapter four described the process of developing a vision and how that vision guided the growth of the eMuseum. Chapters five and six detailed what was involved in designing an eMuseum and offers guidance on technology decisions. Chapter seven explained how to evaluate the eMuseum through formative assessment and summative evaluation. Finally, chapter eight addressed issues related to maintaining the eMuseum and ideas for finding funding to start up and sustain the eMuseum.

Resources such as books and websites that contained useful information for planning and developing an eMuseum were included in the handbook. These resources were set apart from the text of the handbook in boxes and marked with an icon for easy reference. A pencil icon was used to identify websites, books, or articles that contained more information on a particular topic. An exclamation mark icon was used to indicate a tidbit of information that might save the reader time and trouble. A wrench icon was used to recommend tools that would assist the reader in the process of creating an eMuseum.

Preliminary Field Test

The handbook prototype for creating eMuseums was evaluated through a preliminary field test. Five experts were asked to complete a questionnaire to review and evaluate the prototype. The preliminary field testers were drawn from a pool of experts who met at least one of the following criteria:

1. Recognized as an expert in digital libraries, museum informatics, and/or museum education (e.g. project manager or developer).

2. Published refereed articles or conducted multiple national workshops on creating digital libraries or eMuseums.

3. Held local, state, or national memberships in organizations that dealt with digital libraries or eMuseums (e.g. American Association of Museums, Library & Information Technology Association).

Preliminary field test experts included Ms. Liz Bishoff, Dr. Paul Marty, Mr. Chistopher Raab, Mr. Larry Schmidt, and Dr. Drew VandeCreek. Table 3 contains a description of the qualifications of the preliminary field test experts.

Table 3. Preliminary field test experts.

Name	Qualifications
Ms. Liz Bishoff	1. Executive Director of the Colorado Digitization Program and has worked with libraries and museums on collaborative digitization initiatives. 2. Led the development of collaborative best practices in metadata. 3. Nationally renowned speaker and publisher of multiple peer reviewed articles about developing digital collections.
Dr. Paul F. Marty	1. Assistant Professor of Museum Informatics at Florida State University's College of Information. 2. Member of American Association of Museums (AAM), Museum Computer Network (MCN), and American Society for Information Science and Technology. 3. Internationally renowned scholar and speaker on museum informatics, collaborative work practices in museums, and usability analysis and museums on the web.
Mr. Christopher Raab	1. Archives and Special Collections Librarian at Franklin & Marshall College. 2. Directed several digitization projects for Franklin & Marshall College. 3. Presented nationally and published articles about developing digital collections.
Mr. Larry Schmidt	1. Librarian at the University of Wyoming who has led digital projects at the University of Wyoming. 2. Presented at national level conferences on developing and maintaining digital collections. 3. Published peer-reviewed articles about digitizing collections.
Dr. Drew VandeCreek	1. Director of Digital Projects at Northern Illinois University. 2. Published several articles about developing digital collections.

Each expert was given a copy of the handbook, a letter of instruction (see Appendix A), and a questionnaire (see Appendix B). Experts were asked to determine the product's general quality by rating the handbook on a questionnaire and providing feedback comments. The questionnaire had three sections. The first section focused on the format of the handbook, which included readability, sequence, and organization of the book. This section addressed how easy the handbook was to use, navigate and understand. The second section focused on the content,

including the relevance, usefulness, and quality of the content. This section addressed whether the book would give leaders the information necessary for creating an eMuseum. Section three provided the expert an opportunity to provide specific comments on the handbook. This section addressed the need for the expert to provide information directed to specific areas.

The narrative feedback provided substantive information. Areas of consensus among experts and consistency between Likert scale responses and narrative feedback were examined, identifying trends. Any expert responses that were unclear to the researcher were clarified through follow up methods such as email and telephone calls. These data were used to determine the strengths and weaknesses of the handbook.

Specific comments from the preliminary field test for each of the format related items are listed in Table 4. Any action taken based on the expert's comment was described in the *Research Actions* column of the table. The research actions were categorized with three identifiers: *Agreed*, the research agreed with the suggested change by the expert and made a corresponding change to the handbook; *Disagreed*, the researcher disagreed with a suggested change by the expert and indicated the reasoning for not making a change to the handbook; and *Acknowledged*, the researcher acknowledged a comment and any changes to the handbook based on this comment were described.

Table 4. Preliminary field test format-specific responses.

Expert Comment	Research Action
1. Content is presented in a logical sequence.	
Yes. This can be tough to do, as a linear document is not necessarily the best way to present this content, especially since the process of developing eMuseums is not necessarily a linear one. Within these limitations, however, I think the content is presented fairly logically.	Acknowledged.

The handbook follows a logical sequence first by letting users know who the book is intended for.	Acknowledged.
In the section discussing how to determine the need for an eMuseum it might be beneficial to include a section that talks about the long term commitment up front. Not only do you have ongoing costs you also have to account for the cost of determining the need for the museum. I know each section covers specifics but it does not hurt to reiterate key points that will impact the overall process more than once.	Agreed. More information about the long term commitment and ongoing costs was added to Chapter One.
2. Organizational components facilitate reader use.	
I'm not sure what "organizational components" are, but if you are talking about the different sections like "did you know" or "tools" or "more information" then yes, I think they were helpful, but occasionally I found them distracting as I read through the text. Again, I think this is a limitation of the paper based format, where some of these components would work better as sidebars online.	Acknowledged. I agree that the paper based format is limiting and hope that the guide will eventually be available in an online format.
Table of Contents is clear and concise and the subheadings add to the ease of use for navigation through the document.	Acknowledged.
The eMuseum Development Model is a nice illustration of the overall pathway to building a successful eMuseum but the "FUNDING" should also be linked to the "Determine organization's need for an eMuseum as this is also an up front cost that needs to be addressed.	Agreed. Reworked the eMuseum Development Model to reflect that "Funding" should be linked to "Determine

	organization's need for an eMuseum".
Figure 5.2 is not very clear. You should add a legend to the figure so we know each individual's role, color coding might help but I found this to be extremely difficult to follow? Also is there a link to the physical collection? It might be nice to see how the two relate to each other.	Agreed. Color coded Figure 5.2 and added a legend to make it easier to follow. "Adding a link to the museum's physical collection" is a recommendation for improving the eMuseum website, not the eMuseum handbook.
I would also like to say that your example really works for this Handbook.	Acknowledged.
3. Text is clear, concise, and easy to read.	
Yes, very clear and well written!	Acknowledged.
I found the handbook easy to read and it is clear and concise. I do not have comments other than keep up the good work when you make changes!	Acknowledged.
4. Handbook is presented in an attractive format.	
Overall yes, although at times I felt overwhelmed by the different types of content, including images large and small, at least three different colors of inset text information, tables, etc.	Agreed. Decreased the number of colors used throughout the handbook from three to one (a soft yellow used to distinguish inset text information).

Nicely done!	Acknowledged.

Overall, experts provided positive feedback through their narrative comments regarding the format of the handbook. Likert scores for the format questions were used in conjunction with reviewers' comments. If a section consistently scored low in a particular area, then the score indicated a need to focus more attention on revising that area. The researcher observed a trend in expert suggestions about a need to emphasize information about costs and funding, which was addressed by reworking the eMuseum Development Model and adding more information about long-term costs. One expert indicated that there were too many colors used throughout the handbook and as a result, the researcher decreased the number of colors used throughout the handbook from three to one.

Experts provided feedback on the content of the handbook through four questionnaire items. Specific comments for each content specific item are listed verbatim in Table 5. Additionally, any action taken based on the preliminary field test comment is described in the *Research Actions* column of the table.

Table 5. Preliminary field test content-specific responses.

Expert Comment	*Research Action.*
5. Content is based on current practices.	
Yes, I thought it very helpful that you provided real life examples throughout.	Acknowledged.
You might want to mention more on preservation and backup.	Agreed. A section about preservation and backup was added to Chapter 6.
Mention that it is often more economical to form	Agreed. Included

partnerships with a consortia of museums, libraries or other entities that have the storage and application infrastructures to hold material for the long term. These partnerships can offer infrastructure at a fraction of the cost of "going it alone".	information about the benefits of consortia activity in Chapter Two.
Don't forget that digital preservation includes making sure that the digital object and metadata are not only backed up but also enabled to be transitioned from one format to another. This is why working with universities, libraries and other entities in the business of putting material online is a good idea, as they are already thinking on these terms.	Agreed. Information about backing up digital objects and metadata, as well as working with other entities on this task was added to Chapter Six.
On page 21 "Building an Audience" you might mention placing links on the host website, education sites or libraries.	Agreed. This information about placing links on the host website, education sites or libraries was added to the "Building an Audience" section.
6. Scope of the content is appropriate.	
Yes, although I was surprised that Chapter 5 (Designing the eMuseum) was limited to only one chapter, as the information covered in that section could easily have filled more than one chapter (e.g. digitization, digital rights management, graphic design, etc.).	Disagreed. This suggestion was not accepted because technical details about designing the eMuseum (e.g. digitization, graphic design, etc.) fall outside of the scope of the handbook as indicated in the book's introduction: "This handbook does not focus on

	technical details, but instead provides an overview of the eMuseum creation process. Those interested in technical details such as developing metadata and digitizing materials have other resources to turn to, many of which are referenced in this handbook."
Although it is intended to be "A Step-by-Step Handbook for Information Leaders" it may be more appropriate to say it is directed towards the museum community	Agreed. Reworked the introduction to narrow the target audience for the handbook as museum leaders.
7. Handbook provides accurate information.	
Yes, although the main difficulty with a handbook of this type is the unavoidable need to simplify complex topics, and at times I worried that certain sections were a bit over simplified (e.g. the section on metadata).	Agreed. Added "Assigning metadata can be a complex task involving more than simply inserting descriptions in assigned fields. Developing metadata may involve developing a standardized vocabulary and providing administrative metadata related to an item's accessioning, preservation, and collection use. Structured metadata

	conforms to a predictable standardize structure. Metadata that is highly structured provides more ways for users to manipulate and search items. A resource that provides a good overview about using metadata is *Introduction to Metadata: Pathways to Digital Information* by Tony Gill, Anne J. Gilliland, Mary S. Woodley" and *Dublin Core Meta Data Best Practices* by the CDP Metadata Working Group http://www.cdpheritage.org/cdp/documents/cdpdcmbp.pdf
I would like to note that on page 9 the statement "The Internet has become the main source of information for all types of research" is incorrect. Remember that the Internet is a tool for access to online resources not a source itself and that most serious researchers still use databases, online journals and other resources for their information. I don't want users to get the wrong impression about the Internet.	Agreed. Sentence was changed to "The Internet has become the main vehicle for accessing information for all types of research."
8. Overall, the handbook will be a useful tool.	
Yes, especially because of all the useful citations and references provided!	Acknowledged.

I think the handbook will be a useful tool for small museums that are interested in getting a web presence. Not only will it show museums that online collections are possible and hot to go about setting one up it also illustrates that the online collection will give them a larger presence by advertising their existence to users throughout the world.	Acknowledged.

Overall, preliminary field test experts found the content of the handbook to be comprehensive; however, they indicated that more information was needed about preservation, backing up data, metadata, and consortial activities. Therefore, the researcher expanded the handbook to include information on these topics. One expert indicated that although the handbook is intended to be for information leaders, it might be more appropriate to target the handbook towards the museum community. After reviewing the handbook and the results of the preliminary field test, the researcher agreed that the audience for the handbook should be narrowed to museum leaders. The handbook's title and introduction was changed to reflect the narrower target audience. The title of the handbook was changed from *Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Information Professionals* to *Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Museum Professionals*

Preliminary field test experts were asked to answer four questions that would indicate how the handbook could be improved. Comments from these questions are listed verbatim in Table 6. Additionally, any action taken based on the preliminary field test comment is described in the *Research Actions* column of the table.

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Table 6. Preliminary field test additional comments/suggestions.

Expert Comment	Research Action
9. What is the greatest strength of the handbook?	
Greatest strength is the overall content of the handbook. It is very informative, accurate information that is clearly written.	Acknowledged.
The figures and tables are very useful, as are the quick tips and links in various color boxes/themes.	Acknowledged.
A key to help identify the clip art would be very helpful (see *Dummies* books for an example).	Agreed. A key to icons used in the handbook was added to the introduction.
The way it covers so much ground, providing a useful overview of complex topics with numerous references for additional information.	Acknowledged.
One of the great strengths of the Handbook is that it is concise and easy to follow.	Acknowledged.
Discussions are backed up with references and major points are highlighted in color.	Acknowledged.
The fact that you discuss both statistical and human feedback on assessment and evaluation shows that you have looked into one of the most important aspects of online resources. Users have to be able to use these sites otherwise there is no point in putting them up!	Acknowledged.

The handbook's greatest strength is its thorough treatment of the subject. Organizations without much experience in this field will find it very useful.	Acknowledged.
10. What is the greatest weakness of the handbook?	
The text heavy introduction and inclusion of online library examples. This handbook is about museums, and digital library projects generally serve a different purpose. The Library of Congress site is not an eMuseum in my opinion. Library digital projects serve to enhance access to the material, not the institution. I see eMuseums as having a strong digital component for sure, but also a strong educational, physical site or building component, online store/merchandising, membership component, etc.	Agreed. Reworked the introduction to make it less "text heavy".
The way it provides a necessarily simplified overview of complex topics, although this is very hard to avoid in a project like this.	Acknowledged.
I would like to see more emphasis on the costs associated with setting up the collection, costs associated with evaluating the need for a collection or exhibit and the ongoing costs associated with maintaining online collections at the beginning of the handbook.	Agreed. More information about the costs associated with setting up the collection, evaluating the need for a collection, and maintaining online collections was added to Chapter One.
The handbook does not mention costs associated with determining the need for an online collection. The example used mentions assessment through focus groups	Agreed. Included audience assessment costs in Chapter One.

and surveys but does not mention how it was accomplished at what cost. These types of assessment tools can cost a lot and unless outside funding or a partnership is created to help fund the evaluation the museum may consider skipping this step or will do an incomplete or poor student instead.	
The text is occasionally repetitive. This is not a major weakness.	Agreed. Went through the text and tried to eliminate repetitive text.
11. What content would you add or delete?	
I would not delete any content, but would add more about ongoing funding. Information on granting agencies is important, but other options would be helpful to the reader – corporate sponsorship, special member support, special event support, etc. I would also like to see more about marketing and publicity to go along with the good section on assessment.	Agreed. Added information on additional sources of funding including corporate sponsorships, e-commerce, special event support, and training and consulting.
I'd like to see the content in Chapter 5 expanded to more chapters. It seems odd to have only one chapter on design, after four chapters on Needs Assessment, Partnerships, Audience, and Vision.	Disagreed. This suggestion was not accepted because technical details about designing the eMuseum (e.g. digitization, graphic design, etc.) fall outside of the scope of the handbook as indicated in the book's introduction: "This handbook does not focus on technical details, but instead

	provides an overview of the eMuseum creation process. Those interested in technical details such as developing metadata and digitizing materials have other resources to turn to, many of which are referenced in this handbook."
Try and add more details on consortia or other methods for partnerships to give users ideas for working with others so they know that "going it alone" may not be easy.	Agreed. Included information about the benefits of consortia activity in Chapter Two.
Add more content to best practices for metadata standards.	Agreed. More resources about best practices for metadata standards were added to Chapter Six.
On p. 13 the section "Website Development" should acknowledge the significance that database development can play in this work.	Agreed. Section was revised to include database development.
On p. 18 the bibliography is missing a reference to the Bennet, Sandor, Pianfetti study.	Agreed. Bennet, Sandor, and Pianfetti study was added to the bibliography.
12. What suggestions do you have for making the content more clear or understandable?	
Flesh out the introduction to more of a bullet point executive summary. That approach works well in the rest	Agreed. Reworked the introduction to make it less

of the chapters, why not the introduction? I would also add an index.	"text heavy" and added an index.
Is there going to be an online version of this document? I think there are many aspects of the handbook that would lend themselves very nicely to the online environment, and I think an online version would be especially valuable.	Acknowledged. For the purposes of this dissertation there will not be an online version, but I would like to see an online version of the handbook implemented in the near future.
Page 13. Long-term storage. "The eMuseum requires a server to be stored on for the long-term". You might want to reword this sentence ex. The eMuseum requires a server on which the digital objects will be stored on a long-term basis.	Agreed. Sentence was reworded.
The author could revisit the prose and find sentences that begin with the same phrase that concluded the last, or other repetitive aspects.	Agreed. Went through the text and tried to eliminate repetitive text.

The preliminary field test experts provided helpful feedback to the researcher for revising the handbook. More than one comment was made about the introduction of the handbook being too "text heavy". The researcher responded to these comments by reworking the introduction by incorporating bullet points to alleviate the text heaviness. Expert comments about adding a key to the icons used in the handbook and an index were also accepted and added. Three comments were made by experts about the need to incorporate more information about costs associated with developing eMuseums. Specifically, costs associated with setting up the collection,

assessing audience needs, and maintaining the eMuseum were mentioned. The researcher addressed these comments by adding more information to Chapter One about the costs associated with these activities. Also, an additional section was added to Chapter Eight about maintenance costs and finding additional funding sources such as corporate sponsorships, e-commerce, special event support, and training and consulting.

Of all the suggestions offered by the preliminary field test experts, there was only one with which the researcher disagreed. One expert wanted to see Chapter Five, "Designing the eMuseum", expanded into more chapters about design. This suggestion was not accepted because technical details about designing an eMuseum (e.g. digitization, graphic design, etc.) fell outside of the scope of the handbook, as indicated in the book's introduction: "This handbook does not focus on technical details, but instead provides an overview of the eMuseum creation process. Those interested in technical details such as developing metadata and digitizing materials have other resources to turn to, many of which are referenced in this handbook."

Overall, the feedback gathered from the preliminary field test experts contributed substantially to the revised handbook that was sent out for the main field test.

Revisions to Prototype

Revisions of the eMuseum handbook prototype were based on the data collected from the preliminary field test. There were two major types of revisions that were considered during this stage. First, there were changes necessary in the content of the handbook for improving its substance, and second, there were changes related to the handbook's content delivery (Dick & Carey, 1985, 2001). Format changes included design, layout and readability while content changes consisted of modifications to the substance of the handbook. Revisions made to the handbook as a result of the criticism of the preliminary field test experts added validity to the

handbook and the comments shared by the experts were seriously regarded and incorporated into the revision. In the event that the researcher received feedback that she was inclined to reject, the research objectives were used to determine whether or not an opinion would be the catalyst for a particular revision. This process included a comparison of that opinion to the results of the literature review, and the evidence found as a result of the research objectives. This set of research data determined whether the expert feedback was incorporated or overridden.

Main Field Test

A main field test was completed using the revised version of *Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Museum Professionals*. The purpose of the main field test was to obtain additional information on the usability and usefulness of the handbook. The researcher originally proposed to have seven museum leaders participate in the main field test. To obtain at least seven completed reviews of the handbook, the researcher contacted a total of fifteen museum leaders to request their participation in the main field test. Out of those fifteen museum leaders, nine agreed to review the handbook and complete the questionnaire. On October 27th, 2007, nine museum leaders were given a copy of the handbook, a letter of instruction, a questionnaire, and a deadline of November 20th, 2007 (see Appendices C and D). When the deadline arrived, the researcher had received completed questionnaires from only three of nine reviewers. The researcher followed up with the remaining seven reviewers via e-mail requesting that they still review the handbook, even though the deadline for feedback had passed. Out of those seven people, four responded they would still be willing to review the handbook. Two weeks later, the reviewer received two more completed questionnaires. Once again, the researcher followed up via e-mail with the remaining two reviewers who did not respond to her request to return the handbook's completed questionnaire. After much effort to

solicit reviews from museum professionals, the researcher was only able to collect five completed reviews.

Five museum leaders completed a questionnaire to review and evaluate the revised handbook. Two of the museum leaders had working knowledge of creating online environments and three museum leaders had high interested, but no day-to-day working knowledge in creating eMuseums. A total of five museum leaders were used in the main field test. The two museum leaders with day-to-day working knowledge of creating online environments were selected based on either of the following criteria:

1.   Have been employed by a library or museum and creates digital information resources on a regular basis.

2.   Have been nominated by a main field test participant as a digital information or museum leader with experience in creating online environments.

Three digital information or museum leaders with high interest (but no day-to-day working knowledge) in creating eMuseums were selected based on either of the following criteria:

1.   Regularly used digital information resources, such as digital libraries or eMuseums.

2.   Have been nominated by a main field test participant as a person with high interest in creating eMuseums.

Main field testers included Ms. Deborah Arenz, Ms. Elisabeth Engel, Ms. Allison Heller, Ms. Stephanie Kohn, and Ms. Tara Lannen-Stanton-Fritzler. Table 7 contains information regarding the qualifications of the main field testers.

Table 7. Main field test leaders.

Name	Qualifications
Deborah Arenz	1. Senior Museum Curator, Nebraska State Historical Society. 2. Museum website had limited digital images and materials for teachers http://www.nebraskahistory.org/.
Elisabeth Engel	1. Curator of Collections, Waukesha County Historical Society and Museum. 2. Museum website had no digital collections or curriculum materials http://www.wchsm.org/.
Allison Heller	1. Collections Manager, Hellenic Museum and Cultural Center. 2. Museum website had no digital collections or curriculum materials http://www.hellenicmuseum.org/.
Stefanie Kohn	1. Curator, National Czech & Slovak Museum & Library. 2. Museum website has image galleries and curriculum materials http://www.ncsml.org/.
Tara Lannen-Stanton-Frizler	1. Head Librarian, Arab American National Museum. 2. Museum website has multiple online galleries and resources. Curriculum materials are available, but not on their website http://www.arabamericanmuseum.org/.

The museum leaders who participated in the main field test were provided a sample of the handbook, a letter of instruction, and a questionnaire that served as the main evaluation tool (see Appendixes C and D). The questionnaire consisted of a series of 12 questions, providing opportunities to provide three types of feedback. First, there were four questions that addressed the usability of the handbook. Second, the evaluation included four questions that dealt with the content, including the relevance and usefulness of the handbook. These questions evaluated whether the handbook provided the necessary information for the planning, creation and evaluation of eMuseums. Finally, four questions provided the field testers with the opportunity to make specific comments about suggestions for revising the handbook's content.

Once returned, the narrative feedback from the questionnaires provided substantive information. Areas of consensus among users and consistency between Likert scale responses and narrative feedback were examined, seeking trends. User responses that were unclear to the researcher were clarified through followed up methods such as e-mail and telephone calls. The information gathered through this evaluation determined the usabilty of the handbook for the targeted audience.

Specific comments for each format specific item are listed verbatim in Table 8. Additionally, any action taken based on the main field test user comment is described in the *Research Actions* column of the table. The research actions were categorized with three identifiers: *Agreed*, the researcher agreed with the suggested change by the user and had made a corresponding change to the handbook; *Disagreed*, the researcher disagreed with a suggested change by the user and indicated the reasoning for not making a change to the handbook; and *Acknowledged*, the researcher acknowledged a comment or suggestion, any changes to the handbook based on this comment or suggestion were specifically described in the table.

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Table 8. Main field test format-specific responses.

Expert Comment	Research Action
1. The handbook is organized in a logical sequence.	
The booklet is great in that you can move to whatever section you like and it flows logically from broad concept to narrower application.	Acknowledged.
2. The writing is clear, concise and easy to read.	
There are a few spelling errors throughout that will need to be fixed prior to any sort of publication but otherwise I thought it was very well written. I appreciated your explanations of terms such as RSS and metadata and the like.	Acknowledge. Re-read the handbook and corrected a few spelling errors.
3. The handbook is presented in an attractive format.	
I assume when the handbook is actually published, the tables and figures will be in color. I also would suggest having a more comprehensive list of resources and references at the end of the book.	Agreed. Created a comprehensive list of sources at the end of the book.
The flowchart key on page 31 is a great idea; however, the example used is a bit cluttered and just made me think "there's no way I'd ever do this, it's too confusing".	Agreed that the flowchart example on page 31 is too confusing. Removed the example from the handbook.
The "tidbit" sections are nice, and a great way to highlight further research.	Acknowledged.
4. Overall, the handbook provides useful information.	
I found the handbook very useful. Too often when folks use examples of projects from their institutions as the basis for articles and presentations they simply regurgitate what they did and how it worked for them. I like the fact	Acknowledged.

that you provided a framework for how to organize and develop and eMuseum and simply punctuated it with examples from the NLM project.	
The website links are also very nice and I've bookmarked a few myself.	Acknowledged.

Overall, reviewers provided positive feedback through their narrative comments. Specific suggestions regarding format changes were seriously regarded an incorporated into the handbook. Likert scores for the format questions were used as a measure in conjunction with reviewers' comments. If a section consistently scored low in a particular area, then the score indicated a need to focus more attention on revising that area.

Two reviewers indicated that Figure 5.2 of the Structure flowchart for the NLB eMuseum was cluttered and confusing. Reviewers during the preliminary field test also found this particular flowchart confusing. It was apparent, based on these reviewers' comments, that the researcher's attempts to clarify the flowchart were unsuccessful. As a result, the researcher removed the confusing flowchart from the handbook. Another reviewer recommended adding a more comprehensive list of resources and references at the end of the book. The researcher agreed that such a list would be useful and added a resource list the end of the handbook.

Reviewers provided feedback on the content of the handbook through four questionnaire items. Specific comments for each content specific item are listed verbatim in Table 9. Any action taken based on the main field test reviewer's comment was described in the *Research Actions* column of the table.

Table 9. Main fielt test content-specific responses.

Expert Comment	Research Actions
5. Content is relevant and timely.	
The links I checked were all up and running. A great plus.	Acknowledged.
You've hit on issues that are recurring concerns/talking points for museum employees – access, partnering, relevance to audience, etc.	Acknowledged.
6. Content provides appropriate guidance, suggestions, and resources on how to plan and create an eMuseum.	
In general, I thought so. The handbook provided an appropriate amount of guidance for the organization of an eMuseum and I could even see our organization even using it as a framework for developing an eMuseum. However, I think it might be worthwhile to beef up the section defining what an eMuseum is. I believe many museums, large or small, would consider their current websites, no matter how flush or bereft of information it is, an eMuseum. I think what you are trying to help museums accomplish is something more indepth than a simple searchable database and a few small exhibits online. You are encouraging further exploration and use of the information on museum websites in whatever capacity the museum and their constituents need. I believe that comes across after reading the whole text, but not when just reading the eMuseum description. You do state, "eMuseums are online spaces that provide multiple levels, perspectives, and dimensions of information…" which is great, but that statement is followed up with a bulleted list that suggests less constitutes an eMuseum. I think some	Agreed. Reworked the section in chapter one on "Defining the eMuseum" to reflect that eMuseums are more than online databases and online exhibits. Went into more depth defining the components of an eMuseum.

folks might put the book down after reading the bulleted points and say, "Great, we've already done that".	
I really liked the emphasis on planning the practical costs of a project (pg. 13) and that you expand on that issue, drawing the reader away from just the initial concern of data conversion costs and the excitement of a project like this.	Acknowledged.

7. Content provides appropriate guidance, suggestions, and resources on how to evaluate and eMuseum

Yes, I liked the section on web analytics especially. Very helpful for luddites like me.	Acknowledged.

8. The content blends theory, research, and practice into a practical resource for a museum professional.

I thought it was very helpful and would like to share it with my colleagues here at xxx historical society. I hope you will publish this in some form someday.	Acknowledged.
I liked the mix of research information with anecdotes about how your team solved issues. Perhaps a few statements on what you tried that didn't work and why, I find that kind of information helpful, along the lines of "if it didn't work in that setting, can it work for mine?".	Agreed. Added a piece in section "6.2.2 Create Browsable Video Clips" about the failed attempt to match video clips with previously existing lesson plans and what was learned from that experience.

Overall, reviewers found the content of the handbook to be useful. Based on feedback

from the reviewers some content changes were made to the handbook. One reviewer suggested

that the section in Chapter One defining the eMuseum be expanded to reflect that an eMuseum

was much more than just a wesbsite with a searchable database and a few online exhibits. The researcher addressed this reviewer's feedback by reworking Chapter One to provide a more indepth definition of an eMuseum and included a visionary description of what the ideal eMuseum would look like. Another reviewer commented that it would be helpful if the handbook incorporated examples of what the eMuseum team tried that did not work. As a result of this comment, the researcher added a piece in section "6.2.2 Create Browsable Video Clips" about the team's failed attempt to match video clips with previously existing lesson plans and what was learned form that experience.

The last section of questionnaire items asked reviewers to give specific comments/suggestions on the handbook. Comments for each item are listed verbatim in Table 10. Additionally, any action taken based on the main field test reviewer's comment are described in the *Research Actions* column of the table.

Table 10. Main field test specific comments/suggestions responses.

Expert Comment	*Research Actions*
9. What revisions should be made in the writing and format of the handbook?	
Page 17, I am not certain that it is always necessary to form a partnership when creating an online museum collection. It is helpful, but not necessary	Acknowledged. I agree with this reviewer's statement. However, the focus of this particular handbook is partnering.
I would also suggest putting more emphasis on the selection of the content for the site. There is a lot of discussion about selecting the audience, but not necessarily about the actual content.	Agreed. Expanded section "5.1.3 Step Three: Selection of Objects" to include guidelines and additional resources for selecting content for the eMuseum.

The flow charts were very confusing rather than illuminating.	Agreed. Eliminated the flow chart.
When making lists in text, it might be more easy to read if they are done in an actual list format (one on each line), rather a list in text (ex. P. 17, difficult questions, top of page), more like list on pg. 19 of roles involved in the eMuseum team.	Agreed. Reformatted the content on page 17 appear as a list of bullets.
Also, I don't think you need the image of the unprofessional/homemade website. I think those of us that use the internet know what they look like. It might also put folks whose website resembles that on the defensive. Encourage, don't embarrass.	Agreed. Removed example of an unprofessional looking website.
10. What suggestions do you have for making the content more clear or understandable?	
I like the icons, highlighted sections and examples from the websites.	Acknowledged.
See above about flowcharts. Also, many museums do not have all the experts and staff available to create a "team" as suggested in the handbook. Maybe offer ways a very small, low budget museum can get an emuseum going.	Agreed. Removed the image of the flowchart. Emphasized the importance of forming partnerships to develop an eMuseum.
I would take all the resources cited at the end of each chapter and collect them in the references at the end of the handbook, some appeared to be missing. It makes it easier	Agreed. Created a comprehensive list of sources at the end of the

to use the references as a quick guide, perhaps arrange them by chapter.	book and arranged them by chapter.
See previous comments. On the whole it was a very easy read.	Acknowledged.

11. What areas need more clarification?	
Perhaps a bit more information on how the emuseum development "team" was selected. How long did this process take? What is the involvement of each team member? Did it interfere with their day to day activities?	Agreed. Added content in section "2.3 Selecting the eMuseum Team" describing how the NLB eMuseum team members were selected. Also explained the team members' involvement in the process and the length of time it took to complete.
The wrench, pencil and exclamation point, although explained in the beginning may not necessarily be remembered. I would suggest just using a text box. It seems unprofessional.	Disagreed. Icons are an easy way for readers to glance through the handbook and identify sections where resources are recommended.
Overall, I thought this was a very timely and helpful resource. I passed it on to the director of our curatorial department and he was similarly impressed with the content and suggestions.	Acknowledged.

12. Additional Comments	
I enjoyed reading it.	Acknowledged.
Kudos on a job well done!	Acknowledged.

I'd like to share it with my colleagues but will refrain if you'd rather I do so.	Acknowledged.
One last thing, in your handbook you identify it as being for small museums. If you plan to publish this in some format I'd drop that term or at least add the term "medium." You're limiting your audience. Many museums that fall somewhere in between small and Smithsonian could benefit from this handbook.	Agreed. Reworked the introduction to identify the handbook as being an appropriate guide for both medium and small sized museums.
Perhaps an addition on grants – I know that my institution places a lot of emphasis on attempting to fund through grants as well as partnering. Grants are a wonderful way of meeting costs when partnering isn't enough.	Agreed. Reworked the last chapter on funding so that the first section is about grants and the second section is about other means of fundraising.
Is there any research on the impact of eMuseum sites to front door attendance – increase attendance after using the eMuseum site? I know that many institutions are worried about walk through attendance and what it can mean for bottom line dollars. Can eMuseum's help in drawing people in? How are hits on the eMuseum counted in museum attendance figures?	Agreed. Reworked chapter one to include research about the impact of museum websites on museum attendance.
Did you and your teammates contact other museums with eMuseum sites? Is there any information from that contact that could be incorporated into the booklet? This might provide more information on what was useful and	Agreed. During the proof of concept phase for the handbook, three professionals with

| what wasn't. | eMuseum/digital collections experience were contacted. Information gleaned from their experiences was incorporated into the handbook. |
| An idea of expansion/revision of your work – perhaps this might make a good Technical Leaflet for the American Association for State and Local History leaflet series. | Acknowledged. |

Overall, the reviewers found the handbook to be useful, but had some suggestions for improvement. Feedback from the reviewers resulted in several changes to the handbook. One reviewer inquired about the existence of research on the impact of eMuseum sites on museum attendance. The researcher decided that the answer to this question belonged in the first chapter of the book. The researcher did a literature review and identified research articles that discussed studies about the relationship between museum attendance and museum websites. The results of these studies were incorporated into the first chapter of the handbook. In response to a reviewer's inquiries about how the eMuseum team was selected and how long the eMuseum took to create, information was added to Chapter Two. New information added to Chapter Two described how the Negro Leagues Baseball eMuseum team members were selected and explained each team members' involvement and time commitment to creating the eMuseum. Based on reviewer feedback that more information was needed about selecting materials for the eMuseum, Chapter Five was revised to include guidelines and additional resources to help the reader select content. Additional comments from the reviewers indicated that they enjoyed reading the handbook with some mentioning that they shared the handbook with their colleagues.

Final Product Revision and Dissemination

Final revisions of the handbook were made based upon the results of the main field test. The recommendations made by the product's targeted group were analyzed and considered for revision based on research of the relevant literature, observations and interviews, and formative and summative evaluation of the handbook. When the handbook received feedback that the researcher was inclined to reject, the research objectives were used to determine whether or not an opinion would be the catalyst for a particular revision. This process included a comparison of that opinion to the results of the literature review, and the evidence found as a result of the research objectives. This set of research data determined whether feedback from main field test participants was overridden or incorporated. In summary, this research and design approach provided a process to develop, test and revise a handbook for planning, creating and evaluating an eMuseum.

The results of the study, including the final revision of *Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Museum Professionals* and the dissertation will be used to disseminate information about the study. A copy of *Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Museum Professionals* will be provided to each of the proof of concept experts, the preliminary field test leaders and the main field test reviewers.

CHAPTER 4 - Validated Product

Planning, Creating, and Evaluating eMuseums:

A Step by Step Handbook for Museum Professionals

The validated product resulting from this study was a handbook that appeared in Chapter
Four of the completed dissertation. Because this product is being commercially published as a
handbook, the full product has not been included in this electronic submission.
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Table of Contents

Introduction

The purpose of this handbook is to guide the reader through the stages of planning, creating, and evaluating a user-centered eMuseum. Several guides to building websites and digital libraries exist, but none of these guides explain the process, from beginning to end, of planning, creating and evaluating an eMuseum. This handbook does not focus on technical details, but instead provides an overview of the eMuseum creation process. Those interested in technical details such as developing metadata and digitizing materials have other resources to turn to, many of which are referenced in this handbook. The purpose of this handbook is to provide an overview of the process of planning, creating, and evaluating an eMuseum, giving medium and small sized museums the framework and guidance needed to create an eMuseum.

The eMuseum Development Model (see Figure 2) illustrates the steps involved in creating an eMuseum. Each chapter of this book details a step in the development process. Chapter one begins with defining an eMuseum. By understanding what an eMuseum is, it can be determine if an eMuseum will benefit the organization. Once a decision has been made that an eMuseum will be beneficial to the organization and its users, the audience is identified and partnerships are developed. Chapter two explains the value of external partnerships and some of the ways that museums can collaborate with outside organizations.

Chapter three discusses how to identify audiences and target the eMuseum to specific audiences. As indicated by the eMuseum Development Model, audience identification and partnership development can occur sequentially, or simultaneously. There are times when the audience will determine who should be involved in the partnership, and there are other times museum's partnerships will determine who the target audience should be. For example, when Kansas State University's College of Education partnered with the Negro Leagues Baseball Museum in Kansas City, together they identified the primary audience for their eMuseum as middle school teachers. If the Negro Leagues Baseball Museum had been partnering with local high school teachers to create the eMuseum, the target audience would have been high school teachers instead of middle school teachers.

Once the audience has been identified, a vision can be developed for the eMuseum. The vision will guide the direction that development of the eMuseum will take during the next stage of development – design of the eMuseum. Chapter four describes the process of developing a vision and how that vision guides the growth of the eMuseum. Chapters five and six detail what is involved in designing an eMuseum and offers guidance on technology decisions made about the eMuseum. During the design of the eMuseum, evaluation of the format and content of the website will occur. Once development of the eMuseum is complete, a summative evaluation of the entire site is conducted. Revisions to the eMuseum site are based on the summative evaluation results. Chapter seven explains how to evaluate the eMuseum through formative assessment and summative evaluation. Throughout the process of the developing the eMuseum, funding will need to be secured. External and internal funding sources are needed to support not only the initial implementation of the eMuseum, but to support the long-term maintenance of the website. Developing and implementing an eMuseum is not a one-time project, but instead a long-term commitment that needs to be

maintained. Chapter eight addresses issues related to maintaining the eMuseum once developed and ideas for finding funding to start up and sustain the eMuseum.

eMuseum Development Model

Figure 2 eMuseum Development Model

```
┌──────────────────────────────────────────────────────┐
│        Determine organization's need for an eMuseum    │
└──────────────────────────────────────────────────────┘

F   ┌─────────────────────┐        ┌─────────────────────┐
U   │  Identify Audience   │ ◄────► │ Develop Partnerships │
N   └─────────────────────┘        └─────────────────────┘
D
I           ┌──────────────────────────────┐
N           │         Create Vision          │
G           └──────────────────────────────┘

            ┌──────────────────────────────┐
            │        Design eMuseum          │
            │ (content, layout, technology   │
            │          decisions)            │
            └──────────────────────────────┘

            ┌──────────────────────────────┐
            │   Complete Summative Evaluation │
            └──────────────────────────────┘

                   ╭───────────╮
                   │  Revise?   │ ──── IF YES ────
                   ╰───────────╯

                      IF NO

                    Maintenance
```
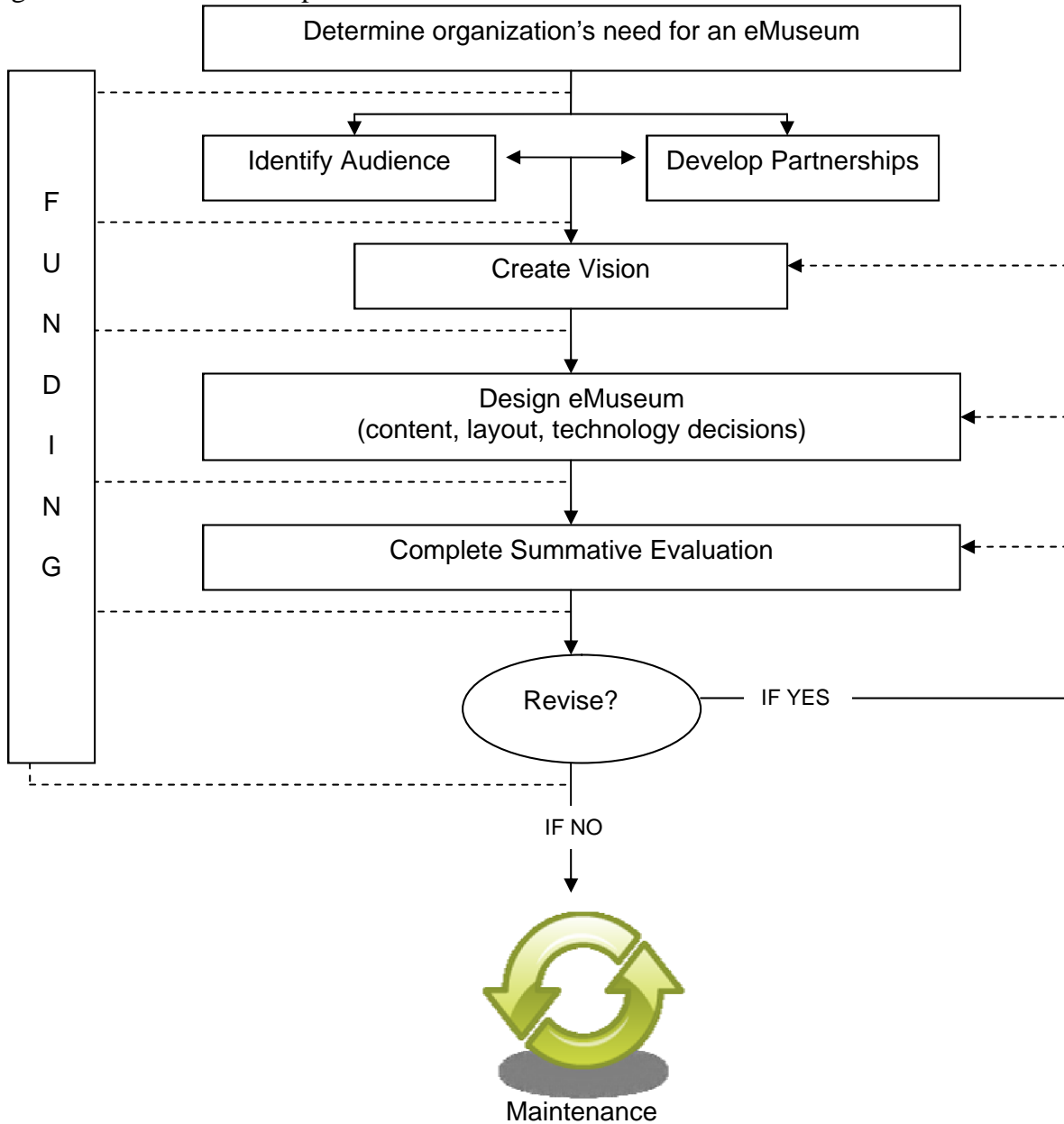
Many of the examples used in this handbook are a result of partnership between Kansas State University (K-State) in Manhattan, Kansas and the Negro Leagues Baseball

Museum (NLBM) in Kansas City, Missouri. In 2005, graduate students and faculty from K-State's College of Education collaborated with the NLBM to create the Negro Leagues Baseball eMuseum (NLB eMuseum). This collaborative experience is the basis for much of the content in this handbook.

Who Should Use this Handbook

This book is intended for leaders in medium and small sized museums interested in collaborating with community stakeholders to create an eMuseum. This includes museum curators, directors, and educators. The handbook will also be of interest to those thinking about developing partnerships with outside organizations. Throughout the handbook coverage is given to the development of collaborative relationships and the steps involved in creating an eMuseum.

How To Use this Handbook

The guide is written so that readers can read the book from beginning to end, or skip ahead to the chapter that best meets their needs. Many web-based resources are recommended throughout the book, making the text a useful reference guide for those wanting to create eMuseums or focus more narrowly on something such as implementing Web 2.0 technologies into a currently existing website.

Icons Used in this Handbook

The pencil icon identifies a reference indicating that more information is available on the topic. The reference will be for a website, book or article.

Whenever you see the exclamation mark, look for a tidbit that might save you time and trouble.

The wrench icon indicates the recommendation of tools to assist the reader in the process of creating an eMuseum.

CHAPTER 5 - Conclusion

Introduction

Chapter five summarizes the research and development activities used to create *Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Museum Professionals*. This chapter also presents the conclusions, implications, and recommendations for future studies from the study.

Summary of Activities

The purpose of this study was to research, develop, test, and validate a handbook for planning, creating, and evaluating interactive, user-centered eMuseums that integrate information management. The goal of the resource was to guide museum professionals through the process of planning, creating, and evaluating an eMuseum. The research and development methodology developed by Borg and Gall (1989) was adapted and used for this study.

The proof of concept for *Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Museum Professionals* was conducted in the spring of 2006. A need was identified and the researcher proceeded to conduct information gathering and review of the literature from January, 2006 through August, 2006. A draft of the handbook was developed between September, 2006 and June, 2007. The Preliminary Field Test was conducted in June, 2006 through July, 2006 with five nationally recognized experts in the fields of digital libraries, museum informatics, and museum education. Revisions to the handbook, based on the feedback from the Preliminary Field Test, were completed in October, 2007. The Main Field Test was conducted from November, 2007 through December, 2007 with five museum leaders. Two of the museum leaders had working knowledge of creating online environments and three of the

museum leaders had high interested, but no day-to-day working knowledge in creating

eMuseums. Revisions to the final handbook, based on recommendations from the Main Field

Test were completed in January, 2008.

Research Questions and Results

The purpose of this study was to research, develop, test, and validate a handbook for

planning, creating, and evaluating interactive, user-centered eMuseums that integrate information

management. The following research questions were established and answered.

How can museums and community stakeholders (e.g. schools, museums, libraries, etc.)

partner effectively to create eMuseums that promote creative teaching and learning?

Throughout each stage of the R & D process, including the review of the literature, the

proof of concept interviews, preliminary field test, and main field test data gathered indicated

there was a need for museums to develop partnerships, but there were two major challenges

preventing partnerships from being developed. The first challenge was a lack of understanding

by museum professionals about the numerous benefits of developing partnerships. Although

museum leaders had a vague understanding that partnerships could be beneficial for their

museum, there was not a thorough understanding of the many ways that these partnerships could

enhance their organizations. The results of the study indicated that for museums to form

successful partnerships for building eMuseums, their leaders must first identify who their key

stakeholders are. These stakeholders might be found in consortial groups, local schools, libraries,

and colleges. Once museum leaders identified potential stakeholders, they could determine why a

partnership would be mutually beneficial for those involved in the partnership.

The second major challenge was a lack of knowledge by museum professionals about

how to begin developing partnerships with stakeholders. Many museum professionals indicated a

desire to develop mutually beneficial relationships with stakeholders, but did not know how to

proceed in developing partnerships. As a result, specific strategies, examples, and

resources museums and community stakeholders could use to develop partnerships for

creating eMuseums were developed by the researcher based on data gathered from the

literature review, practical experiences, and feedback from the preliminary field test

experts and main field test participants. These strategies, examples, and resources for

developing partnerships were presented in *Planning, Creating, and Evaluating eMuseums:*

A Step by Step Handbook for Museum Professionals.

<u>What steps are involved in creating a user-centered eMuseum?</u>

The study resulted in the creation of a step-by-step model for developing eMuseums. The

steps involved in creating a user-centered eMuseum were determined by information gathered

from researching the literature, experience developing the Negro Leagues Baseball eMuseum,

proof of concept interviews, preliminary field test results, and main field test results. The

resulting eMuseum Development Model guided museum leaders through the steps involved in

creating a user-centered eMuseum. Preliminary and main field test reviewers indicated that the

steps presented in the eMuseum Development Model and detailed in the handbook

provided a framework to use when creating an eMuseum.

Conclusions

The purpose of this study was to develop a resource for creating an eMuseum. *Planning,*

Creating, and Evaluating eMuseums: A Step by Step Handbook for Museum Professionals

addressed the primary audience of museum professionals working in small and medium sized

museums. The handbook was designed to include information to address the research questions

that were developed in this study as well as to provide additional resources and information to

assist museum professionals who wish to increase their reach to audiences via eMuseums. Internet and print resources were included in the handbook to provide additional tools for museum professionals. The following conclusions were drawn from this study:

There was a need for a handbook to guide museum professionals through the steps of planning, developing, and evaluating an eMuseum. Museum leaders indicated a desire to create a stronger online presence for their museums, but did not know how to begin the process. The idea of creating an eMuseum was overwhelming to some professionals, indicating the need for a handbook that described the step-by-step process of planning, creating, and evaluating an eMuseum. Proof of concept experts and field test participants found the handbook filled a gap in their professional practice. Interest in the handbook was high, as evidenced by reviewers' feedback during the preliminary and main field tests. Reviewers from the preliminary field test indicated they were interested in reviewing the handbook because guidance was needed on how to form partnerships to develop digital collections, including eMuseums. Also, several reviewers from the main field test requested permission to share the handbook with their colleagues and expressed a desire to see the handbook published and made widely available. The handbook was especially helpful for people creating eMuseums for the first time.

The handbook was most useful to museum professionals. Originally, the handbook was intended for an audience broadly defined as "information professionals", which included both library and museum professionals. Feedback gathered during the preliminary and main field tests indicated that guide was most useful for museum professionals who worked in small and medium sized museums. Museum professionals, although able to partner with and learn from libraries, considered their needs to be distinct from libraries. The needs described by museum leaders were the focus of the handbook.

Museums and community stakeholders could partner to create eMuseums. Museum leaders could begin partnerships with community stakeholders to create eMuseums by understanding how their needs complemented one another. This could be accomplished by identifying outside organizations that had a stake in the eMuseum's development. Stakeholders included educators who want to use the eMuseum to incorporate standards based curriculum into their classroom or graduate students in education looking for collaborative projects to advance their study. The partnership between K-State and the Negro Leagues Baseball Museum to create an eMuseum was an example of such collaboration. Museum leaders also realized that when developing an eMuseum, it was often more economical to form partnerships with a consortia of museums, libraries, or other entities who had the technological infrastructures to store digitized materials.

Finding new ways to reach their audiences was important to museum leaders. Museum leaders were aware that the majority of their visitors expected to find information about their museum on the Internet and wanted to find ways to reach these audience members. Ultimately, museum leaders wanted to find ways to reach audiences online that would encourage them to visit the museum in person. The handbook helped museum leaders to see that their eMuseum should consist of more than a searchable database of collections. Creating an eMuseum that allowed users to explore digital exhibits, find lesson plans, and interact using web 2.0 technologies was seen as an effective way reach audiences and give the museum a larger presence by advertising their existence to users throughout the world.

Museum professionals found resources listed in the book to be useful. Feedback gathered from the field test reviewers indicated that the handbook worked effectively as a reference guide for creating an eMuseum. Reviewers pointed out that the resources cited in the handbook were

useful and up-to-date and provided more in-depth information about some of the topics covered in the book.

Implications

The handbook resulting from the study proved to be an important resource for museum professionals interested in developing an enhanced online presence for their organization. The following implications were derived from the research, development, and validation of *Planning, Creating, and Evaluating eMuseums: A Step by Step Handbook for Museum Professionals*:

1. The handbook will be made available online as an open access document. By making the handbook freely available online, more museum professionals will be able to use the guide to help them enhance their online presence. The handbook should be made available through a digital repository that is indexed by OAIster, which is a union catalog of digital resources. Digital resources indexed by OAIster have increased visibility and accessibility. An example of a digital repository that would be a suitable venue for the handbook and indexed by OAIster is the K-State Research Exchange (K-REx). Making materials accessible in an open access digital repository makes it easier for potential users to find the handbook in resources like Google, Google Scholar, and others.

2. The handbook could be used as a supplementary text for graduate students. *Planning, Developing, and Evaluating eMuseums: A Step by Step Handbook* would be useful for university instruction in library and information sciences and museum studies. Courses that look at technology leadership, digital collections, or digital collaborations could use the handbook as a text. Programs studying the emerging field of digital collections can be found in most Library and Information Science and Museum Studies programs. Courses

increasingly being offered by these programs include Digital Libraries, Museums and Technology, and Museum Informatics.

3. The guide should be expanded into a website. The website would be more than an online link to a .pdf version of the handbook. The website would be updated regularly to reflect the latest news and trends in developing eMuseums. The website would be an interactive site that incorporates the same features that make eMuseums effective. The website would be developed to allow users to interact with the site's content using web 2.0 technologies such as podcasts, blog postings, social bookmarking, and RSS feeds. Audience members' needs should be assessed to determine how the website can best meet their needs.

4. Chapters from the handbook should be revised and submitted for publication in peer-reviewed journals in museum studies and library science. For example, chapter six from the handbook focuses on incorporating Web 2.0 technologies into eMuseums. This chapter could be revised into an article suitable for publication in a journal.

Recommendations for Future Research

The following are recommendations for future studies in this area:

Future studies should look at the impact of eMuseums on museum attendance. Museum professionals want to develop an online presence to reach their audiences, but they are concerned that this will replace a visitor's desire to visit the museum in person. Getting visitors through the doors of the museum is an important goal for museums and its ability to meet the bottom line. Only a few studies have looked at the impact of museum websites on museum visitation. These few studies have provided evidence that online museums actually drive physical museum

attendance instead of discourage physical visits (Marty, 2008). However, more research needs to be conducted to determine the impact of eMuseums on museum attendance.

Future studies should determine how a *Planning, Developing, and Evaluating eMuseums* website can help museum professionals enhance their organization's online presence. A paper-based handbook for creating eMuseums was developed and field tested for the purposes of this study. However, data gathered from field testers indicated that an online version of the resource would be useful. Though the steps described in creating an eMuseum would be the same when presented on website, the content would be presented in ways unique to online formats. Therefore, a study should be conducted to determine how a website could best meet the information seeking needs of museum professionals interested in developing eMuseums.

Future studies should determine how museums have been successful in securing funding for developing and maintaining eMuseums. Grant funding can help museums begin developing a greater online presence, but funding is needed to maintain and update the eMuseum. Museums need guidance on best practices for securing funding to develop and sustain digital projects such as eMuseums.

Future studies should examine the website usability of eMuseums to determine how eMuseums can meet the information seeking needs of their audiences.

Summary

With the emergence of Web 2.0, museum leaders feel pressured to stay current and relevant to their audiences who expect museums to have a meaningful and interactive online presence. Though many museum leaders know their patrons are online and would like to reach out to them, they do not know how to go about this when time and budgets are limited. Leaders in museums do not have access to a resource that can guide them through the stages of planning,

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creating, and evaluating an eMuseum. Several guides to building curriculum-based websites,

museum websites, and digital libraries exist, but none of these guides integrate the key elements

of each of these types of websites. *Planning, Developing, and Evaluating eMuseums: A Step by

Step Handbook* will be an important contribution to the body of knowledge about museums

partnering to create effective online presences. This handbook incorporates the most useful

elements of each of these types of Websites to guide museum leaders who want to create an

effective eMuseum.

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APPENDICES

Appendix A - Letter of Instruction for Preliminary Field Test

TO: Preliminary Field Test Expert Reviewers
FROM: Tara Baillargeon
DATE:
RE: Preliminary Field Test Evaluation

Thank you for agreeing to participate in the preliminary field test of *Planning, Creating, and Evaluating eMuseums: A Step-by-Step Handbook for Information Professionals*, a guide being developed as part of a dissertation for a doctorate degree in educational leadership at Kansas State University, Manhattan, Kansas.

As previously explained, the purpose of this dissertation project is to research, design, and create a handbook to support information professionals interested in planning, creating, and/or evaluating eMuseums. The research methodology used in this dissertation is Research and Development (R & D), a process in which a product is developed, field tested, and revised on the basis of information received from the field test. Your evaluation will provide me with information for revising and improving the handbook.

Enclosed are a draft of the handbook and the Preliminary Field Test Evaluation. Please return the Preliminary Field Test Survey using the self-addressed stamped envelope no later than _____. Should you have any questions or concerns regarding the process, or need further information please contact my major professor Dr. Gerald D. Bailey or me. Our contact information is enclosed for your convenience. I truly appreciate your willingness to assist me.

Sincerely,

Tara Baillargeon   Dr. Gerald D. Bailey
1216 Colorado St.   Professor of Educational Leadership
Manhattan, KS 66502   303 Bluemont Hall
(785) 532-5760   Kansas State University
tjb@ksu.edu   Manhattan, KS 66506
                                                         (785) 532-5847
                                                         jbailey@ksu.edu

Appendix B - Preliminary Field Test Questionnaire

Preliminary Field Test Evaluation form for *Planning, Creating, and Evaluating eMuseums: A Step-by-Step Handbook for Information Leaders*

Name _____

This evaluation has three parts:
Part 1: Evaluation of the format of the handbook (organization, readability, and usability)
Part 2: Evaluation of the content of the handbook (quality and relevance)
Part 3: Additional Comments/Suggestions

Based on your review of the handbook, please use the following rating scale to respond to each of the following questions by circling the response that most closely matches your views.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

Part 1: Format of the Handbook
Please rate the following characteristics of the handbook on a scale of 1 (Strongly Agree) to 5 (Strongly Disagree).

	SA	A	N	D	SD
1. Content is presented in logical sequence.	1	2	3	4	5

Comments/Suggestions:

	SA	A	N	D	SD
2. Organizational components facilitate reader use.	1	2	3	4	5

Comments/Suggestions:

	SA	A	N	D	SD
3. Text is clear, concise, and easy to read.	1	2	3	4	5

Comments/Suggestions:

4. Handbook is presented in an attractive format.   1   2   3   4   5
Comments/Suggestions:

Part 2: Content of the Handbook
Please rate the following characteristics of the handbook on a scale of 1 (Strongly Agree) to 5 (Strongly Disagree).

	SA				SD
5. Content is based on current practices.	1	2	3	4	5

   Comments/Suggestions:

6. Scope of the content is appropriate.   1   2   3   4   5
   Comments/Suggestions:

7. Handbook provides accurate information. 1   2   3   4   5
   Comments/Suggestions:

8. Overall, the handbook will be a useful tool. 1   2   3   4   5
   Comments/Suggestions:

Part 3: Additional Comments/Suggestions
Please answer the following questions in as much detail as you feel necessary.

9. What is the greatest strength of the handbook?

10. What is the greatest weakness of the handbook?

11. What content would you add or delete?

12. What suggestions do you have for making the content more clear or understandable?

Appendix C - Letter of Instruction for Main Field Test

TO: Main Field Test Reviewers
FROM: Tara Baillargeon
DATE:
RE: Main Field Test Evaluation

Thank you for agreeing to participate in the main field test of *Planning, Creating, and Evaluating eMuseums: A Step-by-Step Handbook for Museum Professionals*, a guide being developed as part of a dissertation for a doctorate degree in educational leadership at Kansas State University, Manhattan, Kansas.

As previously explained, the purpose of this dissertation project is to research, design, and create a handbook to support museum professionals interested in planning, creating, and/or evaluating eMuseums. The research methodology used in this dissertation is Research and Development (R & D), a process in which a product is developed, field tested, and revised on the basis of information received from the field test. Your evaluation will provide me with information for revising and improving the handbook.

Enclosed are a draft of the handbook and the Main Field Test Evaluation. Please return the Main Field Test Evaluation via e-mail no later than _____. Should you have any questions or concerns regarding the process, or need further information please contact my major professor Dr. Gerald D. Bailey or me. Our contact information is enclosed for your convenience. I truly appreciate your willingness to assist me.

Sincerely,

Tara Baillargeon   Dr. Gerald D. Bailey
1216 Colorado St.   Professor of Educational Leadership
Manhattan, KS 66502   303 Bluemont Hall
(785) 532-5760   Kansas State University
tjb@ksu.edu   Manhattan, KS 66506
                                       (785) 532-5847
                                       jbailey@ksu.edu

Appendix D - Main Field Test Questionnaire

Main Field Test Evaluation Form for *Planning, Creating, and Evaluating eMuseums: A Step-by-Step Handbook for Museum Leaders*

Name: _____

Based on your review of the handbook, please use the following rating scale to respond to each of the following questions by circling the response that most closely matches your views.

1 = Strongly Agree

2 = Agree

3 = Neutral

4 = Disagree

5 = Strongly Disagree

This evaluation form has two parts:

Part 1: Evaluation of the usability of the handbook (practicality and understandability)

Part 2: Comments on content of the handbook

Part 3: Additional comments/suggestions

Part 1: Usability of the Handbook

Please rate the following characteristics of the handbook on a scale of 1 (Strongly Agree) to 5 (Strongly Disagree).

	SA				SD
1. The handbook is organized in a logical sequence.	1	2	3	4	5

Comments/Suggestions:

2. The writing is clear, concise, and	1	2	3	4	5

easy to read.

Comments/Suggestions:

3. The handbook is presented in an attractive 1   2   3   4   5
format.

Comments/Suggestions:

4. Overall, the handbook provides useful   1   2   3   4   5
information.

Comments/Suggestions:

Part 2: Comments/Suggestions on Content of the Handbook

Please rate the following characteristics of the handbook on a scale of 1 (Strongly Agree) to 5 (Strongly Disagree).

	SA				SD
5. Content is relevant and timely.	1	2	3	4	5

Comments/Suggestions:

	SA				SD
6. Content provides appropriate guidance, suggestions, and resources on how to **plan and create** an eMuseum.	1	2	3	4	5

Comments/Suggestions:

	SA				SD
7. Content provides appropriate guidance, suggestions, and resources on how to **evaluate** an eMuseum.	1	2	3	4	5

Comments/Suggestions:

	SA				SD
8. The content blends theory, research, and practice into a practical resource for a museum professional.	1	2	3	4	5

Comments/Suggestions:

Part 3: Additional Comments/Suggestions

9. What revisions should be made in the writing and format of the Handbook?

10. What suggestions do you have for making the content more clear or understandable?

11. What areas need more clarification?

12. Additional Comments