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IN Harmony: Sheet Music from Indiana

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IN Harmony: Sheet Music from Indiana
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ABSTRACT

Indiana University Libraries, in partnership with the Indiana State Museum, the Indiana Historical Society, and the Indiana State Library, propose creating an online sheet music collection that will demonstrate how museums and libraries with complementary materials can work cooperatively to create shared digital resources. By concentrating initially on the collections of American sheet music owned by each of the partners, the project will accomplish two highly adaptable goals: 1) it will demonstrate how materials and their attendant metadata—in this case, approximately 10,000 digitized pieces of sheet music and the information used to describe them—can be presented on a single Web site, offering federated searching of all collections or access to one or more selected collections; and 2) it will demonstrate how collaborative digital library development can provide online access to the important regional collections of museums, libraries, and historical societies. These collections may, in fact, be sheet music, or they may be important materials in other formats, such as photographs, maps, manuscripts, or artifacts.

With its broad popular appeal and established research value, sheet music provides an ideal subject matter for this project. Cover designs and lyrics offer glimpses of American history and culture in an engaging, entertaining format. Sheet music has also been used by musicologists as an invaluable resource for the study of musical practices, structures and meanings. Consequently, many libraries, archives, and museums across the country have begun digitizing their sheet music collections and providing access to them on the Web. This project will be the first library-museum partnership to digitize and create metadata for sheet music. However, it will also extend into important areas related to this work in any setting, specifically, the creation, mapping, and enhancement of metadata; and copyright. The project will establish recommendations on descriptive metadata records for sheet music and will test the suitability of various subject schemas for searching. Knowledge gained from this undertaking, therefore, will guide other institutions as they digitize and improve access to their own online collections.

Key to the success of this project will be to identify ways in which different institutions with different practices can coordinate their efforts to achieve shared goals. One of the biggest obstacles to reliable retrieval of online collections is inconsistency in the ways collections are described. Library materials, for example, may be cataloged by a librarian according to widely accepted MARC bibliographic standards; museum items may be described by a curator according to the specific needs of the institution in a local database or collection management system. As a result of this project, we will provide recommendations on mapping from existing metadata schema (that is, how materials are currently described) to an interoperable metadata standard, probably based on some form of Dublin Core.

This project not only builds on the strengths of the partners' sheet music collections, but it also leverages the groundwork for statewide digital library planning begun by the Indiana State Library.[1] In the summer of 2004 the State Library will survey all cultural heritage institutions in Indiana regarding their digitization experience and needs.

Indiana University (IU), as the lead applicant, will bring to the project experience gained in digitizing a portion of IU's Lilly Library sheet music collections[2] and its experience as a founding member of the Sheet Music Consortium, a group of three academic research libraries working toward the goal of building a sheet music portal using the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH).[3] Indiana University is also home to one of the nation's premier digital library programs, which has proven experience in research and development as well as successful project management.

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[1] Indiana Digital Library Summit. http://www.statelib.lib.in.us/www/isl/diglibin/
[2] http://www.dlib.indiana.edu/collections/sheetmusic/
[3] http://digital.library.ucla.edu/sheetmusic/

Narrative

American sheet music has long attracted the interests of musicologists, and in the past 25 years, scholars in other disciplines—including art history, graphic design, sociology, history, and political science, have begun to appreciate its value as a primary resource in the study of American history and culture.

Consider the interest in the sheet music collections at Indiana University's Lilly Library, home to one of the nation's largest collections of American sheet music. Scholars have used sheet music in myriad ways, including, for example, to develop a Web-based database of ragtime music, to illustrate the dust jacket of a book of poetry, to identify period music for performance at an historic site, and to instruct classes in chromatic harmony, vocal performance, and music theory. A recent book on sheet music cataloging lists more than 20 recent scholarly articles and books studying some aspect of historical sheet music.[4]

Sheet music clearly appeals to the general public as well, who seek copies of music from their childhood, the forgotten favorites of an aged relative, or music to perform at schools or anniversary celebrations. Given this interest, it is no surprise that many libraries, archives, and museums across the country have begun digitizing their sheet music and providing access to them on the Web. With rich collections in our own state of Indiana, this project will provide a valuable resource for scholars and public within Indiana, and the nation, as well as provide a model for other library-museum partnerships.

Project Description

Indiana University, the Indiana State Library, the Indiana State Museum, and the Indiana Historical Society propose creating a single Web site to provide access to approximately 10,000 pieces of digitized sheet music from our respective collections. The site, which will appeal to scholars and the general public, grew from recent planning for digital library development in the state of Indiana[5] when we discovered that four major public institutions in the state all hold important collections of popular sheet music.

For *IN Harmony: Sheet Music from Indiana* we will digitize all Indiana-related sheet music[6] in our collections--composer, arranger, publisher, or subject, and then select additional pieces by genre or theme, based upon recommendations of librarians and subject specialists. We plan to digitize approximately 2,000 pieces of sheet music each from the Indiana State Library, the Indiana State Museum, and the Indiana Historical Society, and 4,000 pieces from the Lilly Library at Indiana University. We will also create and enhance metadata for this sheet music, based upon the specific needs of each partner. The project goals are:

- To provide a mode for fostering collaborative digital library development by partnering with institutions with complementary collections.
- To digitize a portion of the sheet music from these collections and offer access to these materials free of charge on the web;

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[4] Schultz, Lois and Sarah Shaw. *Cataloging Sheet Music: Guidelines for Use with AACR2 and the MARC Format*. Lanham, MD: Scarecrow Press; [Ann Arbor, Mich.] : Music Library Association, 2003, pgs. 198-199.

[5] Kristine Brancolini and Andrea Bean Hough, "The State of Digital Libraries in Indiana and a Vision for the Future," December 17, 2003. http://dlib.indiana.edu/aboutus/indiana_dl.pdf

[6] This project will use as its basis the Music Library Association's bibliographic definition of sheet music, "…single sheets printed on one or both sides, folios (one sheet folded in half to form four pages), folios with a loose half-sheet inserted to yield six pages, double-folios (an inner folio inserted within the fold of an outer folio to make eight pages), and double-folios with a loose half-sheet inserted within the fold of an inner folio to produce ten pages, qualify as sheet music under this definition."

- To bring these materials and their attendant metadata together on a single web site, offering both federated searching of the entire collection and searching of one or more selected collections;
- To explore copyright questions, specifically to test the hypothesis that approximately 90 percent of copyrights have not been renewed for materials published between 1923 and 1964.

All four institutions have important sheet music collections, as described below. Three of them include materials from the collection of Sam DeVincent, an Indiana personality who worked variously as a performer, disc jockey, music librarian, and music director at a Fort Wayne, Ind., radio station. DeVincent collected sheet music for the artistry of the covers as well as for the music, and in 1988 donated an impressive collection of about 130,000 pieces to the Smithsonian Institution. He retained duplicates of some of the pieces in the Smithsonian collection, however, and he continued to acquire additional pieces until his death in 1997. The Indiana State Museum was given his Indiana-related sheet music, some of which was transferred to the State Library, and the Lilly Library purchased the remaining 24,000 pieces.

The Indiana State Library Indiana Division owns a collection of approximately 1,600 pieces of sheet music with an Indiana connection. These pieces date from 1840 (a campaign song for William Henry Harrison) through the 1960s, with the bulk of the music dating from 1890 through 1950. The collection includes a wide variety of pieces: “booster” songs promoting a particular city or railroad stop, centennial songs from state-wide, county, and city celebrations, religious works, college songs, and songs based on the literary works of well-known Indiana authors such as James Whitcomb Riley.

The Indiana State Museum owns about 1,800 pieces of Indiana-related sheet pieces from the Sam DeVincent collection and other sources. The collections include many of the published works of the Von Tilzer brothers, who were born in Indianapolis.[7] Their popular songs include standards such as "Take Me Out to the Ball Game," "I Want a Girl," "Apple Blossom Time," and "Put Your Arms Around Me.” The museum also holds a very good selection of Indiana Ragtime, 1910-1925, and representative collections of composers Hoagy Carmichael and Cole Porter.

The Indiana Historical Society sheet music collection is also comprised of items gathered from a number of other collections, with about 950 items related to Indiana by composers including Irving Berlin, Paul Dresser, Al Jolson, Jerome Kern, Fritz Krull, John A. McGee, Cole Porter, and Albert and Harry Von Tilzer. The museum recently acquired the Jane B. Anderson Sheet Music Collection, with approximately 12,000 items, dating from 1854-1980, in subjects beyond Indiana ranging from semi-classical to vaudeville.

Indiana University: Indiana University’s Lilly Library contains one of the nation’s largest collections of American sheet music: in addition to the DeVincent Collection described above, the Lilly Library owns the Starr Sheet Music Collection, containing more than 100,000 separate items.

Intellectual Access

Users of sheet music collections in libraries and museums have historically encountered problems with regard to intellectual access. Collections tend to be large, and thus often do not

[7] http://parlorsongs.com/thismonth/feature.asp

receive item-level cataloging. Users often must browse through boxes of sheet music organized in broad categories, often created by a collector instead of a librarian or archivist. Item-level records, if they exist at all, are usually brief and found in special databases, not the online catalog. The collections to be included in this project illustrate this inconsistency. Some of the IU sheet music is cataloged in a custom-designed database and a small amount is cataloged in MARC, but the majority of IU sheet music, from the Starr Collection, is not cataloged at all. All pieces in the Indiana State Library collection have been cataloged over several decades, and records are currently in the library's online catalog, but they do not conform to current cataloging standards. The majority of the Indiana Historical Society collection is not described at all. The Indiana State Museum collection is cataloged in the museum's collection management system, but the cataloging lacks several desired data elements such as roles (e.g., composer, lyricist) of each contributor. Thus, bringing together this disparate metadata will be a challenge.

Use and Potential Use of the Collections

The partners' collections receive varying amounts of use. The collection at the Indiana State Library collection, for example, is largely unknown to patrons. Digitization will increase visibility for all the collections, and with visibility comes use, whether for scholarship or recreation. The combined online sheet music collection will be used by scholars to study the history, culture, and trends in 19th and early 20th century music in America's heartland, including Indianapolis' jazz tradition. Teachers from elementary through high schools will assign their students assignments or class papers using this collection as an example of primary sources. Students will use these materials to complete their class papers or assignments. Music enthusiasts will use the collections for personal enrichment and recreation. Archivists, librarians, and museum specialists will use the collections for exhibits and programs. Best of all, of course, digitization allows worldwide access via the Internet.

We anticipate that we will also attract new users to our collections by offering metadata to the various metadata harvesters. IU has offered sheet music metadata since fall 2003. IU's Lilly Library, which holds the two sheet music collections represented by the harvested metadata, noticed a dramatic increase in requests for sheet music once the Old Dominion Harvester became indexed by Google in November. E-mail inquiries increased from 14 during the three-month period January-March, 2003, to 161 during the period November 15, 2003-March 15, 2004.

Copyright

Users of digitized sheet music are often hampered by copyright restrictions. Due to uncertainties about the copyright status of a particular piece of sheet music, most online collections only display works published before 1923. For example, The Lester Levy Sheet Music Collection[8] at Johns Hopkins University and the Maine Sheet Music Project[9] both follow this practice. However, copyright for works published between 1923 and 1964 had to be renewed in the 28th year. Based upon a study conducted by the U.S. Copyright Office, many copyright experts believe that approximately 90% of copyrights for materials published between 1923 and 1964 were never renewed.[10] Attorney Stephen Fishman reports an overall renewal figure of 15%, but 35% for

[8] http://levysheetmusic.mse.jhu.edu/

[9] http://www.library.umaine.edu/friends/otree/otv11n2/musicbox.htm

[10] Samuel Demas and Jennie L. Brogdon, Determining Copyright Status for Preservation and Access: Defining Reasonable Effort, 41 Library Resources and Technical Services 323-334 (October 1997), citing a study for the United States Copyright Office, James J. Guinan Jr., Duration of Copyright. In *Copyright Law Revision*. Studies prepared for the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary, United States Senate, 86th Cong., first [-second] session, 8. Washington, D.C.: U.S. Govt. Print. Off.: 1961.

music.[11] Famous works were probably renewed but works by obscure composers had probably lost their commercial value within 27 years and thus, were allowed to pass into the public domain. New arrangements of older works also serve to complicate the situation. (See Appendix B for our preliminary research in this area.)

For this project, we propose conducting copyright research in order to determine whether the sheet music selected from after 1923 is still covered by copyright. We will display digitized sheet music for every work determined to be in the public domain. We will also seek permission for works still covered by copyright in order to determine if this is a feasible alternative. We want to provide access to as much digitized sheet music from these collections as possible.

Duplication

We anticipate that there will be some duplication among our collections. Many songs were published in multiple versions, so we believe that we will have multiple instances of the same song to compare. The smaller collections (those at the Indiana State Library and the Indiana State Museum) will be digitized in their entirety. The larger collections, including the Starr Collection from Indiana University and the Indiana Historical Society collection, will be digitized selectively, using the metadata we create to identify titles and versions not found in the other collections.

National Impact

Many libraries, archives, and museums have begun digitizing their sheet music and providing access to it on the Web, as evidenced by a Web site maintained by the Music Library Association.[12] Most of the site's links provide access to only one institution's collections, but the recently funded IMLS National Leadership project Maine Music Box[13] brings together sheet music from three libraries, the Raymond H. Fogler Library at the University of Maine, the Bagaduce Music Lending Library, and the Bangor Public Library, which serves as the music library for the Bangor Symphony Orchestra. The Indiana Sheet Music Project will expand upon this previous work to have national impact in four ways:

1. It is the first library-museum partnership to digitize sheet music and offer it free of charge on the Web. This will illuminate the ways that libraries and museums may differ in the ways they provide access to cataloging information and educational information about their collections.

2. It is the first project to bring together metadata from disparate both libraries and museums and work through the issues of providing a consistent mapping, resulting in reliable retrieval of content.

3. It is the first project to research the copyright status of popular sheet music, 1880-1940, and seek permission for copyright-protected sheet music to be displayed free of charge on the Web. Regardless of our success in working with copyright holders, we will make valuable discoveries about the process.

4. The project will also contribute to knowledge about the issues and the agreements that public institutions need in order to collaborate in digital library development. We agree that we can

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[11] Stephen Fishman, *The Public Domain: How to Find & Use Copyright-Free Writings, Music, Art & More,* Berkeley, CA: Nolo Press, 2001, p. 21/3.

[12] http://www.lib.duke.edu/music/sheetmusic/collections.html

[13] http://mainemusicbox.library.umaine.edu/musicbox/index.asp

produce better digital resources more cost-effectively if we work together, but we do not yet know how to operationalize this goal. We have all worked with a single partner, but we suspect that four partners will significantly complicate the situation. *IN Harmony* will provide a test bed for four Indiana museums and libraries that want to work together. We plan to develop model agreements and collaborative methods that we can use within the state to expand the partnership and share with other states that are grappling with the same issues.

Adaptability

IN Harmony: Sheet Music from Indiana will produce a standards-based digital resource, but the four areas of National Impact described above will also be adaptable to all other libraries and museums working collaboratively to provide access to aggregated digital collections. We learned from the Sheet Music Consortium that the biggest obstacle to reliable retrieval is inconsistency among the data providers. In a metadata harvesting situation it is not practical to work with each data provider to normalize their data. But some of the materials we will be working with have not been cataloged yet and we will have the opportunity to work closely with the data providers. We plan to produce a number of documents that can be used by other libraries and museums:

- A standards-based metadata schema and usage guidelines for sheet music collections;
- Mappings from common metadata formats to the sheet music metadata schema;
- The findings of our copyright research into the status of sheet music published between 1923 and 1964;
- The findings of our efforts to obtain permission to make copyright-protected music from this time period accessible via the Web for educational purposes.
- Model agreements between institutions that want to work together to create, deliver, and preserve created digital resources.

Design

The design for *IN Harmony: Sheet Music from Indiana* has four major components: digitization, metadata creation and enhancement, usability, and copyright research.

Digitization

We will digitize all Indiana-related sheet music from the four collections plus a selection of non-Indiana-related sheet music. Each of the four partners will digitize their own sheet music in-house, due to the fragility of the music and the desire on the part of the partners to learn to digitize sheet music and perform quality control. All partners will follow guidelines based upon national standards for image capture. Guidelines will closely mirror those used by Indiana University in our recent sheet music digitization efforts.[14]

The Project Manager will coordinate ordering and installing equipment at the three institutions; IU will use existing equipment. The Project Manager and IU's Digital Media Specialist will also provide imaging technicians with on-site training and documentation on the digitization and quality control processes. Master files created at each institution will be transferred to IU Digital Library Program (DLP) servers via the Internet or by mailing DVD-R media, and automated quality control and creation of derivative files for web delivery will be accomplished through scripts and tools in place at IU. For more information about the digitization plan, please see "Specifications for Project Involving Digitization" at the end of the proposal.

[14] http://www.dlib.indiana.edu/collections/sheetmusic/

Metadata

Indiana University has learned a great deal about appropriate and sustainable levels of description for sheet music collections through our work with the Sheet Music Consortium, cataloging the Lilly Library's Sam DeVincent Collection of American Sheet Music[15], and IU's Variations2 Digital Music Library project.[16] As part of this project, we will publish usage guidelines, including field syntax recommendations, for the metadata model and develop a cataloging tool conforming to the model for use by project partners and as a generally-available tool for other institutions interested in describing sheet music collections.

In addition to metadata mapping and creation, this project will also address usability concerns specifically related to metadata. During the creation of the sheet music harvester, IU, Johns Hopkins, and UCLA conducted usability testing primarily focused on the interface design and functionality of the harvester. However, many issues emerged that could not be addressed. One major area of interest is how robustness and consistency of metadata, especially subject headings, affects successful access to the collections by end-users.

Sheet music collections are often organized by the subject or topic (e.g., the Starr Collection) and some cataloged collections include subject headings from a variety of sources, Library of Congress Subject Headings, Thesaurus of Graphical Materials, Art and Architecture Thesaurus, and the sheet music collectors themselves. Some of these headings describe the cover art, some describe lyric content, and some the style, form, or genre of the music itself. How do we bring together metadata from four disparate sources and still provide intelligible subject searching? In what situations do users attempt subject searching? Which subject schema are the most effective? Should we enhance the individual records we have to improve subject searching? How might we do this? For the records we are creating from scratch, which subject headings should we use?

Usability Overview: User Approach to Subject Metadata

The usability studies for this project will occur in stages. In Phase I we will capture free-form queries posed to both the IU Sheet Music web site and the Sheet Music Harvester. UCLA has agreed to provide us with queries from the harvester. In Phase II, we will collect representative user feedback as end-users interact with a prototype or other controlled setting that utilizes metadata findings from the initial study for further corroboration.

In general, the usability studies will entail:

- Sorting queries into categories of identifiable access points (creator, title, subject, etc.)
- Identifying the percentage of user queries that are subject-based
- Determining categories of subject-related searches (e.g. topical, genre, form, etc.)
- Comparing free-formed queries to the various controlled vocabularies used to describe subject matter by each of the partnering institutions to determine areas of most overlap
- Collecting user feedback to determine the controlled vocabulary that most closely meets their needs

Copyright Research and Permissions

We propose conducting research into the copyright status of sheet music published between 1923 and 1964. We will select approximately 500 pieces of sheet music from our collections that we would like to include in the project. We will check the *Catalog of Copyright Entries* for the

[15] http://www.indiana.edu/~liblilly/music.shtml

[16] http://variations2.indiana.edu/

appropriate years in order to discover which titles were renewed. For the titles that were not renewed, we will contact copyright holders and seeks permission to provide online access to the sheet music.

Management Plan

IN Harmony is a collaboration among the IU Digital Library Program, the Indiana State Library, the Indiana State Museum, and the Indiana Historical Society. The project will be directed by IU, which will serve as the fiscal agent. The project will be managed by a part-time project manager hired for the project. The project manager will work at IU Bloomington, but travel frequently to the partner institutions, all of which are located in Indianapolis within a few blocks of one another. There will also be a project steering committee comprised of the project manager, and a representative from each partner, Kristine Brancolini, Andrea Hough, Dale Ogden, and Barbara Dirks. (Dirks will serve as the coordinator in Indianapolis.)

Metadata Creation and Enhancement

The Metadata Librarian at IU will lead the metadata efforts for this project by tapping into the vast experience and expertise in music description of Lilly Library Technical Services and Public Services staff and IU's Associate Dean for Technical Services; reviewing the recent sheet music cataloging guidelines endorsed by the Music Library Association[17], and applying this knowledge to current metadata standards in order to develop a "best practice" metadata model for sheet music. Our significant experience to date with sheet music description tells us that this model must be simple in order to be usable, but also attend to the specialized discovery needs of sheet music users. For further detail, please see the "Specifications for Projects Involving Digitization."

After the metadata schema has been developed, the Metadata Librarian will work with the institutions that have existing metadata for their sheet music collections and choose to enhance their records to better fit the schema. This work has two advantages: it will increase the usefulness of the metadata in its native format, and it will allow this metadata to better fit with metadata from the other project partners. The Metadata Librarian and the cataloger at each institution will then work together to create guidelines for mapping from existing databases into the newly-developed schema. The project programmer will do the programming work necessary to implement these mappings, under the supervision of the IU DLP Associate Director. The IU DLP will also convert all sheet music records to simple Dublin Core for exposure via our Open Archives Initiative data provider. In addition to making available to the public the sheet music metadata schema we develop, we will also release the cataloging tools so that other institutions with sheet music can use it to catalog their own collections.

Copyright Research and Permissions

The copyright research described above will be conducted by graduate students and staff at the State Library. We have consulted with Kenneth Crews a noted IU copyright expert, and will develop procedures that we will develop using his copyright research on the *Variations2* Project, a digital music library funded by the National Science Foundation;[18] he has previously written guidelines on the determination of public domain status of musical works.[19]

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[17] Schultz, Lois and Sarah Shaw. *Cataloging Sheet Music: Guidelines for Use with AACR2 and the MARC Format*. Lanham, MD: Scarecrow Press; [Ann Arbor, Mich.] : Music Library Association, 2003, p. 1.

[18] http://variations2.indiana.edu/copyright.html

[19] http://variations2.indiana.edu/pdf/dml-copyright-duration-report.pdf

Intellectual Access

In addition to the creation of a sheet music metadata schema, mapping of existing metadata into this schema, and wide sharing of the schema and cataloging tools as described above, the provision of metadata to harvesters via the OAI-PMH is a major focus on the project. The goal of this activity is to provide users worldwide with access to high-quality metadata that will allow for the reliable and consistent retrieval of metadata and, in many cases, a digital surrogate of the sheet music. This work will also be planned and organized by the project manager in conjunction with the Metadata Librarian and others at all four institutions who are knowledgeable about metadata creation in general and specifically for sheet music.

Provision of Network Access and Delivery

The metadata records and images from all four institutions will be made available for free Internet access via the Indiana University Digital Library Program Web site using a similar method as was used for the existing *Indiana University Sheet Music Collections* site. The Bibclass component of the DLXS software suite from the University of Michigan is used to provide browsing and searching of the metadata records, while a locally developed page turner application is used to provide navigation and viewing of the images. The project programmer will make any necessary enhancements to the existing page turner and search interface code. One of the partner institutions, the Indiana Historical Society will also store the metadata and digitized sheet music in their local digital library system, which uses CONTENTdm. This will allow them to integrate their digitized sheet music with their other local collections.[20]

Web Design and Evaluation

Staff from the IU Digital Library Program will lead a Web development team, selecting appropriate user-centered activities to help guide Web design and evaluation; and planning, conducting and interpreting the results of user-centered activities. The evaluation will involve work with all user groups, including secondary students, scholars, and members of the general public. These methods were most recently used successfully in a previously-funded IMLS project, *The Charles W. Cushman Photograph Collection,*[21] and *Letopis' Zhurnal'nykh Statei, 1956-1975,*[22] an online periodical index project funded by the U.S. Department of Education.

Contextual Materials

In order to enhance the educational value of the sheet music collections, professional staff participating institutions will contribute essays and links to related materials for Indiana-related composers, lyricists, and music publishers. These materials will be coupled with selected sheet music content to create online exhibitions that could be used by teachers at all grade levels.

Budget

The major costs associated with the project will support digitizing sheet music, creating, mapping, and enhancing metadata, development of software tools for creating and mapping metadata, loading content and metadata in the digital library system at Indiana University, creating a web site to deliver the content, and conducting copyright research.

Personnel and Contributions

Two part-time staff will be hired for the project, a project manager and a programmer (see attached job descriptions), who will work at IU. In addition, part-time staff and students will be hired to digitize sheet music and catalog it at the IU and the partner institutions.

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[20] http://www.indianahistory.org/library/digital_image/digitalpics.html
[21] http://www.dlib.indiana.edu/collections/cushman/
[22] http://webapp1.dlib.indiana.edu/letopis/index.jsp

Kristine Brancolini, Director, IU Digital Library Program, will be project director, responsible for overall project direction and financial management of the project. Jon Dunn, Associate Director, IU Digital Library Program, will be technical manager, responsible for the storage, delivery, and preservation of the image files and metadata for the project. Jenn Riley, IU Digital Media Specialist, will oversee the digitization of the sheet music, working with the project manager to coordinate the digitization at the four institutions. Metadata Librarian (currently vacant), IU Digital Library Program, will oversee the metadata creation for the project, working with the project manager to coordinate this activity at all four institutions. Harriette Hemmasi, Executive Associate Dean, IU Libraries, will serve as metadata consultant; she is project investigator for the metadata research area of the Variations2 project[23]. Michelle Dalmau, Interface and Usability Specialist, Digital Library Program, will design the interface for the project web site and coordinate the user studies and usability testing planned for the project.
Elizabeth Johnson, Head of Technical Services, IU Lilly Library, will lead metadata creation at IU and consult with the Metadata Librarian and the programmer on the development of the metadata creation tool.

Andrea Bean Hough, Associate Director, Indiana State Library, will coordinate overall Indiana State Library participation. Barney Thompson, Head, Indiana Division, Indiana State Library, will identify pieces for copyright searching; supervise handling of materials; provide quality control. Janet Buckley, Monographs Cataloger, Indiana State Library, will facilitate MARC record mapping to Dublin Core metadata, and supervise enhancement of records. Ron Rose, Head, Circulation Support Division, Indiana State Library, will supervise staff scanning sheet music; provide quality control.

Dale Ogden, Chief Curator of Cultural History, will manage the project at the Indiana State Museum. Katherine Gould, Assistant Curator of Cultural History, will work with the Metadata Librarian on metadata mapping and supervise enhancement of the metadata. Traci Cromwell, Cultural History Collections Manager, will work with the Digital Media Specialist on scanning specifications, supervise the scanning, and perform quality control.

Barb Dirks, Director Library Digital Scanning Project, will coordinate the project at the IHS, do copyright checks, and assist with metadata mapping and creation. Lisa Cahill, Technical Services Librarian, will work with the Metadata Librarian, supervise metadata creation and mapping, and do name authority work. Jim Ketterer, Senior Director, Information Systems, will supervise all technical work at the HIS.

Project Evaluation

Our project has four primary objectives: 1) To create a metadata schema and cataloging tool for sheet music in order to create metadata for undescribed collections; enhance existing metadata; and map existing metadata for sheet music into a standard format; 2) To digitize a portion of our sheet music collections according to standards and to deliver them via a user-tested, intuitive Web site; 3) To conduct research on the renewal of sheet music copyrights filed between 1923 and 1964; and 4) To establish effective agreements for sustaining the working relationship among the four institutions. For the first objective, we will measure success by the completion of item-level metadata records for all of the sheet music included in the project as facilitated by the cataloger's tool we will be developing. The ongoing use of this tool by at least one of the participating institutions will serve as a benchmark for measuring success. The second objective

[23] http://variations2.indiana.edu/metadata.html

relates to the ability to access content from our web site, which we will measure by referring to our logs and documenting user feedback. We will measure the success of the third objective by encouraging other institutions to conduct copyright research thereby providing increased access to sheet music published during these years. Our fourth objective will have been met when we complete the project successfully and develop written agreements among the four partners.

Our project also has two secondary goals: The first is to stimulate interest in the project and encourage other museums, libraries and archives around the state to work with us to add digital content. In this case we will measure success through finding additional partners who are willing to contribute sheet music to the site. The second goal is to stimulate interest in additional digital library projects. We will measure success by future collaboration among the four participating institutions. We do not want this to be our only project; we want an ongoing partnership.

Members of the project team from IU have attended IMLS training in Outcome-Based Evaluation. Members of the project team from the other institutions will be funded to attend this training. We will use the methods we learned there to develop measurable indicators of the project's success.

Dissemination

Information about the project will be disseminated via a project Web site, where we will provide the project proposal and progress reports. Eventually, metadata about the sheet music and digital surrogates for much of the sheet music will be accessible via the Internet. Digital surrogates for sheet music covered by copyright will only be accessible within the home institution, but there will be item-level records for everything on the Web site. We will also disseminate metadata from the project via the OAI data provider operated by the Digital Library Program, offering metadata to all OAI-compliant harvesters.

We also give presentations about the project at a number of conferences, including local events, such as the Indiana Library Federation Annual Conference and the Association of Indiana Museums. We also will publish articles in local and national publications and share findings about sheet music metadata available and how to use a project like this to create library-museum partnerships in other states.

Sustainability

IN Harmony: Sheet Music from Indiana will be maintained and supported by the Indiana University Digital Library Program. All content will be accessible free of charge via the Internet. We will store preservation master files for the Indiana University content in the MDSS (Massive Data Storage System) maintained by Indiana University Information Technology Services. The partner institutions will be preserving their highest quality digital images. One of the goals of the statewide digital planning is to explore options for centralized preservation of digital content. For details about the preservation and migration of digital files, please see the "Specifications for Projects Involving Digitization."

Conclusion

Popular music has a powerful way of evoking memories and emotions and of revealing prevailing social, cultural, and political attitudes. American sheet music of the past century, in particular, offers endless opportunity for scholarship and entertainment. *IN Harmony* will make large amount of this music available to a broad audience and will offer solutions in the challenging areas of metadata and copyright. Moreover, this project will create a national model to guide museums and libraries with complementary collections as they create shared digital resources.

Specifications for
Projects Involving Digitization

1. Describe types of materials to be digitized (i.e., artifacts, maps, manuscripts, photographs, audio recordings, video recordings, motion pictures) and number of each:

For this project, we will be digitizing approximately 10,000 pieces of sheet music, consisting of approximately 60,000 pages.

2. Identify copyright issues and other potential restrictions:

Most of the sheet music that we digitize will be in the public domain, starting with pre-1923 imprints. However, we also plan to digitize some post-1923 sheet music. We will conduct a copyright search for that music. We anticipate that most of this sheet music will also be in the public domain. For the music that is still covered by copyright, we will seek permission to display it on our project Web site. If we are denied, the sheet music will only be displayed within the institution that owns the sheet music and not on the Internet.

3. List the equipment, with specifications, whether purchased or leased, or outsourced, that will be used (e.g., camera, scanner, server):

Each institution will digitize their own sheet music on an Epson Expression 1640XL A3 scanner, using Lasersoft's Silverfast scanning software. Master files created at each institution will be transferred to IU Digital Library Program servers via the Internet and/or by mailing DVD-R media. Automated quality control and creation of derivative files for Web delivery will be accomplished through scripts in place at IU, which make use of various open source image processing tools such as ImageMagick. We will be using an existing IBM eServer pSeries 630 server running AIX 5.2, to which additional disk storage (IBM FASsT200) will be attached to store master image files being processed and derivative image files to be served.

4. Specify each type of file format (e.g., TIFF, JPEG) to be produced and anticipated image quality of each (minimum resolution, depth, tone, pixels):

<u>Master:</u>
Each page of sheet music will be scanned at 300dpi, and the master image file will be saved as uncompressed TIFF. Color covers and other pages with color printing will be scanned in 24-bit RGB color, and other pages without color information will be scanned in 8-bit grayscale. Color matching of the image to the original will be accomplished automatically through the IT8 calibration module in Lasersoft's Silverfast scanning software.

<u>Access:</u>
600-pixel and 1200-pixel tall JPEG access images of each page will be created from the master TIFF files. No image processing (sharpening, etc.) will be necessary.

<u>Thumbnail:</u>
200-pixel tall thumbnail images in JPEG format will be created for the cover page of each piece of sheet music. No image processing (sharpening, etc.) will be necessary.

Formats for other media (e.g., audio, video, motion picture), include sampling rates, if applicable:

We will not be digitizing any materials other than sheet music.

5. Describe the delivery medium that will be used and 2) the digital access management system or systems that will be used to make this material available to others.

The metadata records and images from all four institutions will be made available for free Internet access via the Indiana University Digital Library Program web site at http://www.dlib.indiana.edu/, using a similar method as was used for the Indiana University Sheet Music site at http://www.dlib.indiana.edu/collections/sheetmusic/. The Bibclass component of the DLXS software suite from the University of Michigan is used to provide browsing and searching of the metadata records, while a locally developed page turner application is used to provide navigation and viewing of the images.

6. Describe the quality control plan.

Scanned images will be assessed through a strict quality control process involving both automatic and manual review. Images will be placed on an IU server after scanning, where a script will run to check every image for adherence to many image specifications, including resolution, color depth, and compression. In addition, at each partner institution, a staff member will spot-check 10% of images created to verify adherence to other specifications such as orientation, skew, border, and missed pages.

7. Estimate the cost per image. Include costs such as scanning, quality control, and indexing. Indicate the basis for each calculation.

I have included the cost per image for digitization and the total average cost per piece of sheet music, estimated at 6 pages.

- Digitization, based upon personnel costs for in-house scanning $ 28,162
- Image post-processing and quality control (explained below) $ 28,945

TOTAL $57,107

$57,107 divided by 60,000 pages = $ .95 per page x 6 pages per item = $5.70

Image post-processing and quality control: We have learned that quality control will probably take an addition 15-30 minutes per book. We will run an overnight problem to detect errors in the scanning, but it takes time to assess the problems and correct them. Every image will also require post-process to do things like crop images. This is difficult to calculate because many people will be involved at the four institutions. We arrived at the figure of $28,945 by adding the cost share for all of the staff who have been written in specifically to do quality control, Shana Berger at IU, Rose Rose at the Indiana State Library, and Traci Cromwell at the Indiana State Museum, plus a portion of Barb Dirks's time. She will be doing this work at the Indiana Historical Society. We estimated the time commitment to be 4 hours per week so we added in $7,440 for her work:

$31.00 per hour x 4 hours a week for 60 weeks (the estimated time to digitize 2,000 titles) = $7,440

We did not include costs for describing sheet music because the situation will vary so much from institution to institution and title by title. Some sheet music has been cataloged completely, some minimally, and some not at all. Costs will vary significantly from title to title due to this situation.

8. Explain how content will be discovered through metadata, including which standards you will use (e.g., MARC, EAD, Dublin Core):

We anticipate that the metadata schema we develop will either be a customized form of qualified Dublin Core, or newly-developed Dublin Core Application Profile incorporating elements from MODS. We will create a cataloging tool using this schema that project partners will use to begin describing previously un-described collections. This tool will be developed as a standalone Microsoft Access database, a web-based interface to a relational database such as MySQL or Oracle, or both if possible to provide maximum flexibility for its adoption and use. We will then work with institutions that have existing metadata to enhance their records, then map them into the newly-developed schema. The IU DLP will also convert all sheet music records to simple Dublin Core for exposure via our Open Archives Initiative data provider.

Administrative, technical, and structural metadata are also essential for the short- and long-term administration of a digital collection of this sort. The Metadata Librarian will work with the Digital Media Specialist and the other project partners to ensure that metadata needed for page-turning in web displays, digitization quality control, and long-term preservation maintenance of the digital files will be created, adhering to standards such as NISO's draft standard Z39.87, Data *Dictionary – Technical Metadata for Digital Still Images*, and stored in a robust and sustainable way, making use of METS.[24] The metadata creation tool developed on the project will support entry of basic administrative and structural metadata elements during the scanning process, and will output a METS document containing administrative, technical, structural, and descriptive metadata for each piece for transfer to IU.

9. Describe plans for preservation and maintenance of the digital files during and after the expiration of the grant period (i.e., storage systems, migration plans, and funding):

Metadata records and digital content, including access versions of sheet music image files and accompanying contextual information, will be maintained and supported by the Indiana University Digital Library Program (DLP) via the delivery system described above in question 5. The servers on which the digital content and delivery system reside are located in Indiana University's central data center in Bloomington and are backed up nightly, with backup tapes stored offsite in Indianapolis. IU DLP is committed to migrating this content to new delivery systems in the future as necessary and appropriate.

Master image files from all four institutions will also be stored by IU using its MDSS (Massive Data Storage System) service. The master image files for IU collections in MDSS will serve as preservation surrogates, for eventual incorporation into a digital preservation repository at IU, while those for the other three institutions' collections will be stored to facilitate the generation of additional access derivatives in the future should technological change require it. The preservation copies of the master digital files from the other three institutions will be stored locally at each institution on CD-R or other storage media per local practice.

[24] Metadata Encoding and Transmission Standard: http://www.loc.gov/standards/mets/

In addition, all the data, scripts, programs, source code, and Web pages associated with the Web interface will be archived in the MDSS; all archives will be accompanied by documentation describing their organization and contents. MDSS provides a scalable, network accessible, storage infrastructure to support teaching, research, and administrative computing at Indiana University. The software underlying the MDSS, namely HPSS (High Performance Storage System), is developed jointly by a consortium that includes IBM and a number of national laboratories and supercomputing centers. A hierarchical storage management (HSM) system by design, HPSS enables data stored on fast disks to migrate automatically and seamlessly to fast tape systems and vice versa, thus eliminating the need for explicit tape management in a traditional backup environment. Data stored in the MDSS is automatically mirrored on tapes in both Bloomington and Indianapolis via Indiana's high-speed I-Light network infrastructure connecting the IU Bloomington and Indianapolis campuses. For more information on the IU MDSS and HPSS, please see the IU Distributed Storage Services Group homepage at http://storage.iu.edu/ and the HPSS homepage at http://www4.clearlake.ibm.com/hpss/index.jsp. With archives on the mass storage system in addition to the nightly backups of the Digital Library Program servers, we will have redundant reliable backups of this important information resource.

Indiana University has shown a strong commitment to the continued development and maintenance of IU's digital library infrastructure, and digital library initiatives are featured prominently in Indiana University's information technology strategic plan (see *Architecture for the 21st Century: An Information Technology Strategic Plan for Indiana University* at http://www.indiana.edu/~ovpit/strategic/). This strong commitment from the highest levels of leadership within the university ensures that we will continue to have available the resources to maintain, support, and grow the existing infrastructure and to upgrade and migrate to new technologies as they become available. Currently the Digital Library Program spends more than $250,000 per year in hardware and software upgrade and replacement. We anticipate a continued commitment of resources for the preservation and delivery of digital content.

10. If you are producing collection-level records, describe plans for submitting collection-level descriptive records to a bibliographic utility, such as Research Libraries Information Network (RLIN) or Online Computer Library Center (OCLC):

To be determined.

11. Describe plans for submitting information about the project to a national level registry of digital resources, such as the Association of Research Libraries' Digital Initiatives Database (http://www.arl.org/did/) or OCLC's Cooperative Online Resource Catalog (http://www.oclc.org/corc):

We will create Dublin Core records from the sheet music records to make available to OAI metadata harvesters. We also plan to contribute to the digital registry currently being developed by the Digital Library Federation and OCLC: http://www.diglib.org/collections/reg/reg.htm

12. Provide URLs for applicants' previously-digitized collections:

<u>IU Digital Library Program</u>

The IU Digital Library Program has digitized 2,000 pieces of sheet music from the Lilly Library and made them accessible on the Web:

Indiana University Sheet Music
http://www.dlib.indiana.edu/collections/sheetmusic/

They also digitized sheet music for the Hoagy Carmichael Project, which was completed in 2000:
http://www.letrs.indiana.edu/cgi-bin/hoagy-idx.pl?type=header&idno=ATM-MC2-1

The Digital Library Program is a founding member of the Sheet Music Consortium, which harvests metadata for sheet music collections:
http://digital.library.ucla.edu/sheetmusic/

Indiana Historical Society

The Indiana Historical Society William Henry Smith Memorial Library began digitizing portions of their collections in 2002; currently 3,121 images are online representing a variety of formats: text, black & white and color photos, and drawings:
http://www.indianahistory.org/library/digital_image/digitalpics.html