

Conclusions

By choosing an attentive printer and actively participating in the print process you will learn how to effectively plan successful printing projects. This article covered the basic areas that require your attention and described the places in the printing process where you can gain valuable experience by working closely with your printer. Printing maps is ideally a partnership between skilled map makers and printers; and when you are in such a partnership with your printer success in your projects is almost guaranteed.

map library bulletin board

Building a Digital Collection of Photos and Maps: *Milwaukee Neighborhoods at the University of Wisconsin-Milwaukee Libraries*

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Introduction

Milwaukee Neighborhoods: Photos and Maps 1885 – 1992 was created at the University of Wisconsin-Milwaukee Libraries (UWM Libraries) as a result of cooperation between the Libraries staff and the faculty at the Department of Geography. The goal of the digitization project was to gather unique material from the Librar-

ies' collections featuring Milwaukee neighborhoods, convert it into a digital format, and present it as an online resource to students, faculty, and the general public. The digital collection, available at <http://www.uwm.edu/Library/digilib/Milwaukee/index.html>, provides a visual documentation of the development of Milwaukee neighborhoods.

Drawn from several source collections at the American Geographical Society Library and the Archives Department at the UWM Libraries, the project includes 638 photographs and 12 historical maps of Milwaukee. The maps and images were scanned and integrated into an online system through indexing and descriptive metadata. An extensive research process accompanied digitization to provide not only a consistent description of all images, but also additional access points for image discovery. Following the collection release in March 2004, an evaluation study was conducted to examine user behavior in the resource discovery process and to assess user satisfaction with the collection.

This paper will report on the collaborative nature of the digitization project and will provide an overview of the process of building the collection including selection, scanning, research and indexing, and design of the online collection. It will also explore the usefulness of the collection from the faculty perspective.

Cooperation with Faculty

UWM Libraries initiated a digitization program in the fall of 2001 to take advantage of the rapidly evolving imaging and communications technologies and to share unique resources from the Libraries' holdings with a wide audience. Expanded access and reduced handling of fragile archival materials were recognized as primary

benefits of digitization (Smith, 1999). In addition to the Archives and Special Collections, the UWM Libraries house the American Geographical Society Library with its extensive map and photographic collections.

While work on the pilot digitization project was being completed in 2002, the Libraries staff began to informally survey the faculty on the campus about their interest in digital collections and use of visual resources for research and instruction. Two digital projects resulted from this initial inquiry: *Transportation Around the World: 1911 – 1993* (<http://www.uwm.edu/Library/digilib/transport/index.html>); and *Milwaukee Neighborhoods: Photos and Maps*, the topic of this article. When Geography Professor Judith Kenny suggested the second project, the proposal received the immediate approval and support of the Libraries staff. Based on discussions with faculty members, reference inquiries, and library instruction sessions, the demand for such a digital collection appeared quite obvious. Currently, architecture, geography, and history students among others regularly require materials on local topics for class projects. Ironically, students often find it more difficult to locate images or maps of local areas than of distant cities or countries. Although a few students visit archives or special collections, increasingly they turn to the Web as a primary source of information. According to Steve Jones's study on the impact of the Internet on college students "nearly three-quarters (73%) of college students say they use the Internet more than the library, while only 9% said they use the library more than the Internet for information searching" (2002). Digitization has offered libraries an unprecedented opportunity to meet the students in the space of their choice and reach a wider audience.

Digitization projects benefit from the close partnership with faculty on the campus. As Nancy A. Van House points out “effective digital library (DL) design is not simply a matter of converting existing information practices and artifacts to a digital world” (2003). It requires multiple players and “collaborative knowledge construction” (Van House, 2003). Cooperation with faculty allows academic libraries to identify areas of interest and to build useful and applicable collections that will support instruction and scholarly work. Faculty contributes invaluable subject expertise and a direct connection to users and to the academic curriculum, while librarians bring knowledge of source collections, expertise in digital library standards and practices, and skills in information organization.

When Professor Kenny suggested this theme for the project, she envisioned a collection that would be used regularly by her students and herself for illustrative and research purposes. With a visually oriented general population, she saw the digital collection as an impressive means of immediately “bringing” various areas of Milwaukee to the classroom and thus introducing students to neighborhoods that they might not otherwise have visited. Historical photos provide an opportunity to challenge students’ “taken-for-granted” notions of urban life by showing familiar scenes under past conditions. Students in more advanced urban geography classes are required to consider the changing character of Milwaukee’s neighborhoods for class projects. With easily accessible photographs and maps, their understanding of the changing landscape is enlivened and they have tools for gathering information about their project areas. Finally, Professor Kenny recognized the tremendous resource that the

photographic and map collection represents for community members and researchers beyond the Milwaukee campus. She hoped to share this resource and in this way to encourage research on the city as well as more general topics such as housing, industrial development and change, or the photographic and cartographic images themselves.

Beyond recommending the project, Professor Kenny’s contribution to the project included consulting on the indexing fields for the collection, and preparing an article “Picturing Milwaukee Neighborhoods” for the site. The article, available at <http://www.uwm.edu/Library/digilib/Milwaukee/records/picture.html>, presents a historical perspective on the development of neighborhoods in Milwaukee that will acquaint community members and introductory students with basic information on the city’s growth.

Source Collections and Selection

The images and maps for the *Milwaukee Neighborhoods* project were selected from several source collections of the American Geographical Society Library and the Archives Department. The collections featuring Milwaukee neighborhoods were identified in the planning phase of the project. The digitization project allowed one to gather materials from the collections scattered throughout different departments in the Libraries. Bringing together images from disperse collections resulted in a heterogeneous project where one can correlate and compare images of the same site or building and examine them side by side (see Figure 1, Figure 2, and

Figure 3).

The photos of Milwaukee from the end of the 19th century come from two rare books in the Archives’ holdings: *Milwaukee* and *Art Work of Milwaukee*. The first book, *Milwaukee*, consisting of 98 plates, does not have a title page, therefore the publication date or the name of the publisher cannot be determined. Research of the scanned images, however, indicates that most of the photographs were taken around 1885. The two volumes of *Art Work of Milwaukee* were published in 1895 in Chicago by W.H. Parish Publishing Co. The plates provide images of Milwaukee’s first neighborhoods, Juneau Town, Kilbourn Town and Walker’s Point, and demonstrate a strong German influence on the development of the city.

The images of Milwaukee in the 20th century were selected from two photographic collections: the Roman Kwasniewski Collection, housed at the Archives, and the Harold Mayer Collection, located in the American Geographical Society Library. Roman Kwasniewski was a professional photographer, who in addition to thousands of wedding and first communion pictures also took photos of businesses and urban scenes on the Milwaukee South Side. Many of the photographs were taken at the



Figure 1. Milwaukee River, Downtown, 1895. Source collection: Art Work of Milwaukee.



Figure 2. Milwaukee River, Downtown, 1989. Source collection: Harold Mayer Collection.



Figure 3. Milwaukee River, Downtown, 1898. Fragment of Wright's Map of Milwaukee, published by A.G. Wright, Milwaukee, 1898.

request of local businesses, real estate, and insurance companies, and include images of store grand openings, parades, churches, movie theaters, new housing, car accidents, and floods. They vividly document the life of the primarily Polish-American com-

munity on the Milwaukee South Side between 1910 and 1940.

The Harold Mayer Collection provides a more comprehensive coverage of Milwaukee neighborhoods with images of public housing developments, parks, and industrial facilities throughout the

city. Harold Mayer was a professor of geography at the University of Wisconsin-Milwaukee. He specialized in the Urban and Transport Geography of North America with a focus on New York, Chicago, Milwaukee, and British Columbia. Of the approximately 50,000 slides in the Harold Mayer Collection, 217 color slides were selected for the *Milwaukee Neighborhoods* project. These images show Milwaukee in the years 1948 - 1992.

12 maps of Milwaukee from the holdings of the American Geographical Society Library accompany the image collection. The maps illustrate the growth and development of the city from 1883 to 2000. They were published by a variety of publishers, including Alfred G. Wright, city directory publisher. Most of the maps selected for the digital collections are in the public domain. For the maps published after 1923, the Libraries staff negotiated with the companies holding copyright for permission to post the map images on the collection Web site. Several map publishers granted permission to include the maps in the digital collection without charge.

The selection of images is limited by the current boundaries of the city of Milwaukee, as defined in the 2000 Milwaukee Neighborhoods Map created by the Department of City Development Information Center. An attempt was made to represent all neighborhoods within the boundaries of the city of Milwaukee. The coverage, however, is not even. A few neighborhoods, such as the Near South Side, Downtown, and East Side have a higher number of images due to the concentration of the source photographic collections at the UWM Libraries. The Kwasniewski Photographic Collection is almost entirely devoted to the Milwaukee South Side. There are also images on the Near

South Side in the Harold Mayer Collection. On the other hand, Far Northwest Side, Northwest Side, and Far West Side have a limited representation. The images of these neighborhoods come exclusively from the Harold Mayer Collection. Professor Kenny intends to contribute her slide collection to expand both the neighborhood coverage and extend the dated material in the collection to the present time. With this contribution, it is hoped that other faculty members using the materials will make their collections available as well.

Those images that are part of the current collection represent various aspects of the city's neighborhoods – their historical development, architecture, and community life. The collection presents pictures of industrial facilities, business and commercial enterprises, historic buildings, parks, streets, and residential facilities, including single-family homes, mansions, apartments, condominiums, and public housing developments. There are several photos of Polish flats, a unique Milwaukee housing structure, typical of the Near South Side (Figure 4 and Figure 5). The images depict breweries and tanneries, such as Schlitz, Pabst, and Pfister and Vogel, which once dominated Milwaukee's industrial landscape, and companies that are still in business like Allen-Bradley Company.

Image Capture

Since the project utilizes source materials in a variety of formats, including photographic prints, slides, glass plate negatives, and maps, the conversion process from analog format to digital required versatile scanning equipment. A film scanner Nikon 4000 ED, a large format scanner Colortrac 4280, and two flatbed scanners Microtek ScanMaker E6 and



Figure 4. Polish flat on Milwaukee's South Side, 1933. Source collection: Roman Kwasniewski Photographic Collection.

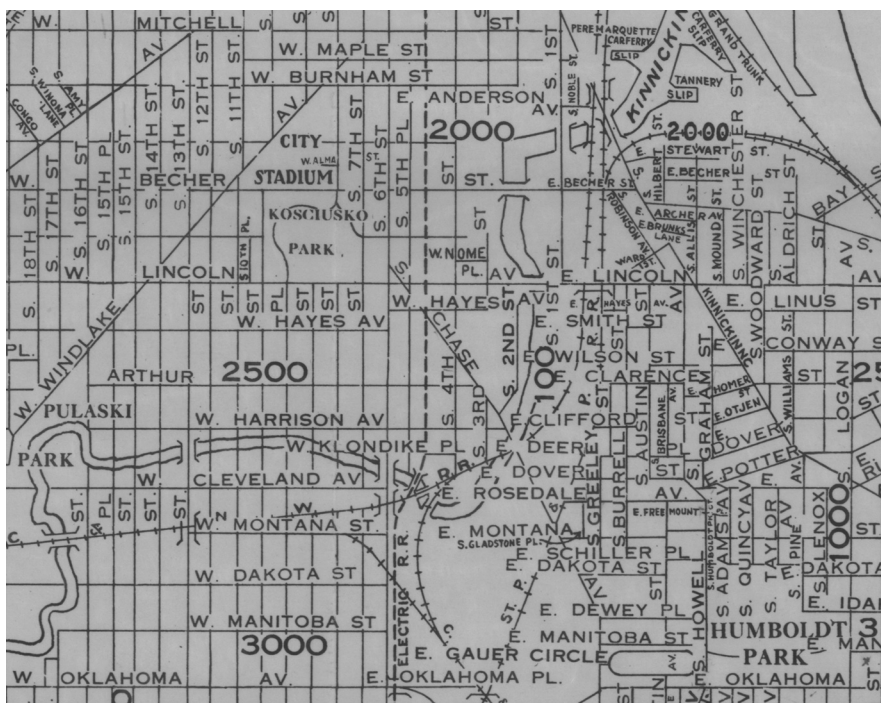


Figure 5. Milwaukee's South Side. Fragment of New Edition Map of City of Milwaukee and Suburbs. Published by Siekert and Baum Stationery Co. and Milwaukee Electric Railway and Light Co., 1934. Copyright by Wisconsin Electric Power Company (We Energies). Used with permission.

Epson Perfection 2400 were used in the scanning process to scan the source materials appropriately to their format. Following a recommendation in the digital library literature images were scanned from the original source items

when possible. Several resources in the field suggest scanning from the earliest generation of the photograph (negative) rather than from intermediaries, such as photographic prints (Frey, 2000; NINCH, 2002). Frey notes, "be-

cause every generation of photographic copying involves some quality loss, using intermediates inherently implies some decrease in quality" (2000). For the *Milwaukee Neighborhoods* project photographic prints were used when the first generation photographs were not available or the negatives were deteriorated.

The photographic prints included in the two monographs *Milwaukee* and *Art Work of Milwaukee* were scanned at 300 ppi resolution using a flatbed scanner Microtek ScanMaker E6. Most of the original prints are 11"x13" or 13"x 11". 300 ppi resolution was sufficient to provide a good quality scan. The RGB (color) mode rather than grayscale was used to capture the aging nature of the print medium and create a faithful reproduction of the original photographic prints.

35 mm color slides in the Harold Mayer Collection were scanned at 4,000 ppi resolution using a Nikon 4000 ED film scanner. The slides were scanned at the highest resolution offered by the scanning software to create high quality master files. As indicated in the *Western States Digital Imaging Best Practices*, "there are compelling preservation, access, and economic reasons for creating an archival-quality digital master image: it provides an information-rich, unedited, research quality surrogate, and ensures rescanning will not be necessary in the future. A high-quality master image will make the investment in the image capture process worthwhile" (Western States Digital Standards Group, 2003).

The same principle was followed in the digitization of images from the Kwasniewski Photographic Collection. The glass plate negatives were scanned at 1,200 ppi or 800 ppi resolution in a grayscale mode using a flatbed scanner Microtek ScanMaker E6 with a transparency adapter. The

original glass negatives are 8"x10" or 5" x 7"; the larger negatives were scanned at 800 ppi, 5" x 7" were scanned at 1,200 ppi resolution. The prints from the Kwasniewski Collection were selected when the glass plate negatives were not available or the quality of the scans from the negatives was poor. The photographic prints were scanned at 600 ppi resolution using Microtek ScanMaker E6 and Epson Perfection 240 flatbed scanners. The prints were scanned in the RGB (color) mode to provide an accurate representation of the original items.

The digital master images were saved as uncompressed TIFF files. The images were edited for contrast, tone, and color balance in Adobe Photoshop. The changes were saved and a second copy of uncompressed TIFF files was produced. Derivative images for Web delivery were created from the master TIFF files. The resolution of derivative files was reduced to 72 ppi and they were saved in JPEG format. The master files in TIFF format are stored at the UWM Libraries and can be used to create a variety of digital derivatives or high-quality prints.

The maps were scanned at 400 ppi resolution using a large format scanner Colortrac 4280. The original scans were saved in TIFF format and then were transferred to the MrSID compression format using ArcGIS software. MrSID, a proprietary format of the LizardTech company, allows one to compress large image files and view them through standard Internet browsers. Users can browse, pan, and zoom into the map files. Viewing the maps requires downloading MrSID viewer (ExpressView Browser Plug-in) from the LizardTech company website at <http://www.lizardtech.com/>. Although the ability to zoom on the map and view detail on the street level is an exciting proposition, an

evaluation study conducted in the spring of 2004 found that users encountered many difficulties in viewing the maps. The need to download the plug-in from an external Web site was identified as a major obstacle. UWM Libraries plans to take advantage of a new open international standard for image compression, JPEG2000 (<http://www.jpeg.org/jpeg2000/>) to replace the map files in MrSID format. CONTENTdm, software suite, which was used to build the online collection, will offer JPEG2000 extension as of August 2004, thus making possible to integrate the maps in JPEG2000 format into the collection. Users will be able to apply interactive zoom and pan features without going through the trouble of downloading a plug-in.

Indexing – Descriptive Metadata

Indexing was the most time consuming part of the project. It constituted approximately 2/3 of the time of the project. Part of the challenge was to create consistent metadata for images from disparate source collections, which vary in the level of description. An attempt was made to provide multiple access points and index the images not only by neighborhoods and subject terms, but also by address, date, and architect name. This approach required additional research. Numerous print and online reference sources were used in the research process including historical maps of Milwaukee from the AGSL holdings and city of Milwaukee directories. A number of images required consulting with the local institutions, subject experts, and community members, and in some cases - field research. The high-resolution master images also made the research possible as they offered extensive detail and often helped in identifying the names of streets and businesses. Descriptive

metadata was first recorded in the Access database, which served as a working database. The data was then transferred to CONTENTdm to build the records.

Indexing fields were determined based on discussions with Professor Kenny, archivists, and librarians at the American Geographical Society Library. The images are indexed by photographer's name, date of photograph, neighborhood, address, subject terms, address, construction date, and name of architect, when appropriate. All records contain a unique digital ID (file name) and the date when a digital image was created. In addition, the records include information about the attributes of original source items, such as original item medium, size, ID, and repository to maintain a relationship between source items and their digital surrogates.

The images are indexed by 12 broad neighborhoods (Far North Side, East Side etc.) as defined in the 1981 publication of the Department of City Development (DCD) *Discover Milwaukee: A Great Home Town*. This publication was also used to create a map of Milwaukee neighborhoods displayed on the main page of the online collection (Figure 6). The map serves as a primary point of access for images from specific neighborhoods. In addition, the images are indexed by more detailed neighborhood boundaries outlined in the 2000 Milwaukee Neighborhoods Map. The map, published by DCD Information Center in 2000, identifies 75 neighborhoods.

An effort was made to index the images by address, when possible. As the street names and house numbers in the city of Milwaukee were changed in 1930, the current addresses and pre-1930 addresses were recorded. *The Wright's Street Guide Supplement to 1930 Milwaukee City Directory* was used to cross-reference the addresses. The data in the address

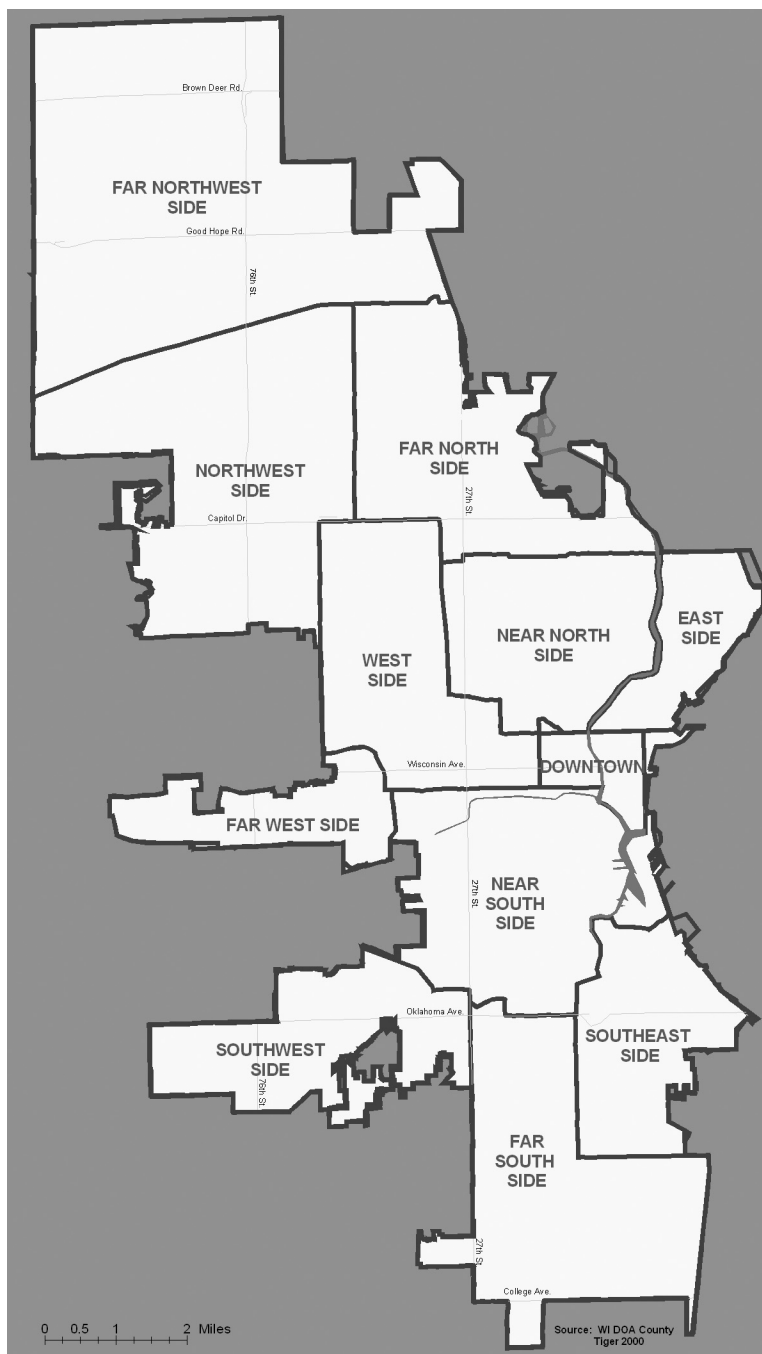


Figure 6. Map of Milwaukee neighborhoods featured on the Home page of Milwaukee Neighborhoods: Photos and Maps 1885–1992.

field is standardized, e.g. 2420 N Terrace AV. There is no punctuation and the following abbreviations are used: ST for street, AV for avenue, RD for road, PL for place, and PK for parkway.

The images are described by subject terms using controlled vocabulary. *Library of Congress*

Thesaurus for Graphic Materials (<http://www.loc.gov/rr/print/tgm1/>) was used to assign subject headings. In addition natural language terms, such as breweries, movie theaters, taverns, and tanneries, are listed in Alternate Terms field. Natural language terms were added to overcome the

limitations of controlled vocabulary and ensure that users have a greater chance of finding images on the topic of interest. There is, for example, no term in the LC Thesaurus for Polish flats, a local phenomena, but relevant to the history of Milwaukee architecture.

In-depth indexing of subject matter using both controlled vocabulary and natural language was undertaken to ensure effective resource discovery. Subject indexing supports quick keyword searching and increases the chances of successful image retrieval. Controlled vocabulary and natural language terms accommodate a variety of users. A librarian may type "motion picture theaters", while a casual user will enter "movie theaters", but both should retrieve pictures of historic movie theaters in Milwaukee. Extensive descriptive metadata not only enhances intellectual control of digital objects, but also builds relationships between images from disparate source collections allowing users to understand them in a new context.

Building an Online Collection

CONTENTdm, a digital media management system developed by the DiMeMa company (<http://www.contentdm.com>), was used to create a digital collection for Web delivery. The records were built using a Dublin Core metadata template. A number of default html and Java script templates provided by CONTENTdm were customized to design consistent navigation and create a graphical identity for the *Milwaukee Neighborhoods* collection. In addition, several HTML page were designed to provide a unique collection interface and multiple points of access.

Dublin Core (<http://dublincore.org/>) was selected as a standard for descriptive metadata. A default Dublin Core metadata

template provided by CONTENTdm was customized to accommodate a larger number of fields in the *Milwaukee Neighborhoods* project and offer natural language field labels specific to the collection, such as Photographer, Date of Photograph, Architect/Builder, Date of Construction, Neighborhood, etc. These fields were then mapped to Dublin Core to ensure interoperability and effective cross-collection searching, e.g. Photographer is mapped to Creator and Date of Photograph is mapped to Date.Created, and Neighborhood is mapped to Coverage Spatial.

The template was further customized to provide additional fields for cataloging maps. Four fields (Requirements, Map Publisher, Map Publication Date, and Scale) were added to the original list. Because the maps are indexed along with images in the same database, users can search for both resources from one search interface. In addition, access to map records is provided from a separate Maps page at <http://www.uwm.edu/Library/digilib/Milwaukee/records/maps.html>.

The collection interface was designed with a user-centered approach to accommodate a variety of users and their different search styles. The Home page features an interactive map of Milwaukee with links to the images in the collection. The map can serve as a first point of access enabling users to browse through the images of the neighborhoods. In addition, the Home page provides a search box allowing users to perform a keyword search across all fields in the collection. The Advanced Search page presents the option of performing a keyword search across all fields or searching an individual field. It also offers pull-down menus with the hyperlinked controlled vocabulary from the Neighborhoods, Subject, and Business/Place fields. The

pull-down menus expose the vocabulary, so users can become familiar with indexing terms. The Browse page is intended for users, who prefer to look through sets of images rather than type specific terms. It displays a number of thumbnails as visual clues indicating the content of the collection, highlights major subject categories and source collections, and enables users to browse the images by date of photograph. Broad subject categories not only demonstrate the content of the collection, but also provide intuitive browsing pathways.

There is also a separate HTML page with an article by Judith Kenny, "Picturing Milwaukee Neighborhoods". The article complements the image and map collection by framing the pictures in the historical and social context. It outlines the development of Milwaukee neighborhoods from the early commercial expansion in the second half of the 19th century through changes in the post World War II era.

The collection interface offers multiple options for accessing the collection to meet the preferences of a variety of users. It provides simple and advanced search functions, the Browse page with a number of predefined queries, hyperlinked subject headings within the records, and an interactive map on the Home page. The historical maps can be accessed from the Maps page or by searching the collection. The site provides consistent navigation and merges HTML pages with customized CONTENTdm templates. The collection interface facilitates leisurely browsing, serendipitous resource discovery as well as a simple keyword searching, a preferred search style of a younger generation of Internet users. The evaluation study of the *Milwaukee Neighborhoods*, conducted in the spring of 2004, found a strong preference for keyword searching

among undergraduate students, while older community users selected browse options more frequently.

Conclusion

Building *Milwaukee Neighborhoods* was a truly collaborative process, which involved several librarians, archivists, graduate student assistants, and first of all faculty. Partnership with faculty was very effective and resulted in creation of a new educational and cultural resource. The library became more engaged in the research and learning behavior of its users recognizing that research preferences of students and faculty have changed. If the Web has become a preferred source of information, it only makes sense for the library to bring its unique resources to the users via digital technology and Web delivery. Cooperation with faculty allowed the Libraries to better recognize user needs and to match the Libraries collections with the research interests of the academic community.

The digital project gave the UWM Libraries an opportunity to showcase archival collections, raise public awareness that these resources exist, and increase the visibility of rare materials, which often are not easily accessible due to their fragile nature. In fact, many of the visual resources featured in this collection are kept in remote storage areas and cannot be easily used. *Milwaukee Neighborhoods* encourages new scholarly use of these unique primary sources. The digital collection not only provides an easy access to these resources for the current library users, but also reaches a wider audience in the online world.

Digital library standards and best practices were followed in the collection building process. The standards were applied consistently to not only ensure the

good quality of the images and descriptive metadata, but also to support interoperability and sustainability of the collection over time. A digital collection, however, is not a static finite object, like a published monograph or a photo album. The process of building or "publishing" in the digital world is never finished. There are definite advantages to this approach. The records in the *Milwaukee Neighborhoods* have been updated with input from the users after the collection's release. In the future, the collection can also be revised and updated in response to user expectations and to incorporate new digital technologies. UWM Libraries is planning to adopt the JPEG2000 standard to create more interactive environment for the presentation of images and maps in this collection. Improvements will also be made in the near future by expanding the collection geographically and chronologically with the incorporation of slides and photographs from faculty members.

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