# MUSEUMLINK

**PROPOSAL SUBMITTED BY :**
**ILLINOIS STATE MUSEUM SOCIETY**

**TO:**

**U.S. DEPARTMENT OF COMMERCE**
**TELECOMMUNICATIONS AND INFORMATION INFRASTRUCTURE**
**ASSISTANCE PROGRAM**

**(AUGUST 11, 1997)**

P R O J E C T  N A R R A T I V E

P R O J E C T  P U R P O S E

**Problem Definition, Proposed Solutions, and Outcomes**

The MuseumLink project combines the educational objectives and missions of the ISM and the ISBE to provide solutions to four problems:

*(1) Access to Information Technology and Training in Underserved Schools.*

*Problem:* Despite major efforts by state government, less than one-third of Illinois public schools provide Internet access for students. Current K-12 connectivity efforts in Illinois are competitive and often reach only one classroom per school. Most of the computers in Illinois schools are not up-to-date and many are inaccessible to students. Approximately 50% of Illinois schools have Internet access, but it is often through a low-speed dial-up connection at one location in the building. Internet access in a single location outside the classroom (e.g., in a library or resource center) does not effectively promote engaged learning or integration of Internet resources into classroom activities. Students without access to telecommunications technology will lack skills critical to the work force in the twenty-first century.

*Solution:* MuseumLink targets classrooms in 12 underserved schools (App. A) to receive powerful computer hardware and software packages that support Internet connectivity and use. Schools were selected based on their amount of general state aid and the total weighted average daily attendance, which provides an indication of the ability of the district to support a child's education. The school districts for the targeted schools had to have an Information Technology Plan that demonstrated a commitment to the integration of technology and information infrastructure in the learning process.

Teachers from 12 underserved schools will receive comprehensive technology training from the ISBE as part of their statewide Museum in the Classroom initiative. These sessions will be held at ISBE Learning Technology Hubs and will cover use of computer hardware and software packages provided to the schools and use of the Internet.

*Outcome:* Twelve K-12 classrooms in underserved schools will receive Internet access and a dedicated, robust hardware and software package (App. B). Classroom Internet capability will provide the access necessary for regular student use and integration into other learning activities. Teachers will increase their computer and Internet skills and the understanding of their application for engaged learning.

*(2) Access to the Internet, Web Resources, and Technology Training in the Community*

*Problem:* Underserved rural and urban students, their families, and the general public do not have access to the Internet and associated Web resources at home. As computers and telecommunications transform learning and information environments, students and the public require exposure to the resources of the Web and training on how to most effectively use this technology.

*Solution:* MuseumLink schools will be encouraged to invite parents into the classrooms to observe their children accessing Internet resources and applying them to real problems. Public access terminals will be installed at the ISM in Springfield, Dickson Mounds Museum (DMM) in Lewistown, and the Southern Illinois Artisans Shop and Visitors Center (SIAS/VC) in Whittington (App. B, Map) and MuseumLink staff will work with Community Advisors at each facility to assess needs and desires for Web resources. A variety of strategies will be implemented and evaluated to facilitate public training. MuseumLink staff will implement two large-scale public training workshops on the use of the Information Superhighway at each of the three ISM venues. Staff will also offer sessions for smaller groups and high school docents will be trained to offer weekend on-site training sessions at the public terminals. Written instructions and online tutorials will also be available. The success of each training approach will be evaluated as a part of the project. MuseumLink public terminals will offer communities access to Illinois-specific information developed for the project and other Web resources.

*Outcome:* Parental classroom visits will increase interest in their child's education and use of technology in the classroom. Apprehensions about Internet technology will decrease. Public access terminals at three ISM venues will available to over 300,000 visitors each year (based on 1996 attendance). Technology workshops at these sites will reach over 1,800 individuals from underserved communities and will make them stakeholders in the National Information Infrastructure (NII).

*(3) Access to Engaging Learning Resources*

*Problem:* Illinois K-12 students need greater opportunity for exposure to technology through engaged and cooperative group learning activities. Museums provide rich resources in the form of exhibits, extensive collections, research data, and expertise in a wide variety of disciplines. However, with shrinking budgets, many schools have cut field trips to museums and other cultural institutions.

*Solution:* MuseumLink students will have the opportunity to conduct cooperative group research using resources accessed through the ISM's Web site and videoconferences with ISM curators, who will share their expertise and present items from the collections. MuseumLink offers more than a virtual museum tour. The presentation of information will stress interactivity and inquiry.

*Outcome:* Access to the NII and up-to-date primary resource data for Illinois will reduce disparities in access to outside resources, spark student curiosity, increase technical skills, encourage increased collaboration, relate learning activities and concepts to real issues, foster student involvement in community-based issues, and heighten student awareness of the individual's role in community stewardship. Students will learn Internet skills as well as critical thinking and research skills using real data and collections. MuseumLink will give students access to a vast array of research and learning tools. Students will not be reading an electronic textbook, but will learn to use the ISM Web site as an electronic library and research laboratory. Students will collaborate with other students and experts through an online discussion group, e-mail, and videoconferencing and will be encouraged to present project results on the Web. Three-hundred MuseumLink students from classrooms at 12 underserved schools will participate in the development and testing of the Illinois-specific Web resources. Once released on the ISM's Web site, the over 2 million K-12 students in Illinois will be able to use the Internet resources as tools for engaged learning about their state.

*(4) Access to Illinois-specific Resources in Schools*

*Problem:* Based on survey results from ISM teacher-training workshops, Illinois K-12 teachers want greater access to Illinois-specific resources on cultural and natural history. Effective educational methods immerse students in the study of their immediate environment as a means of understanding larger contextual issues. However, textbooks are rarely written from a statewide perspective. Illinois students are more familiar with the English colonies on the East Coast and the flora and fauna of rain forests than they are with early French settlements in Illinois and the tall grass prairies that once covered much of the state. Students need information that is presented in an engaging, thought-provoking manner, relevant to their school curriculum, and appropriate to their developmental level.

*Solution:* Through online teacher advisory committees, K-12 teachers will work with MuseumLink staff to target Illinois-specific resources that they would like to see developed for the ISM's Web site. Project staff, including an art/history team and an anthropology/natural history team, will work with the teachers to develop content for online materials. Additional teacher workshops will address ways to integrate content information and learning tools into curricula to satisfy existing state goals for learning. Workshops will also model ways that Web resources can be used in classroom projects to encourage students to be intellectually adventurous and analytical. Both online and printed teachers' guides will be provided. The exchange of information will be two way.

*Outcome:* K-12 teachers from across the state will co-develop and have access to Illinois-specific content information served on the ISM's Web site. The technology and the MuseumLink program will increase communication between educators and result in the sharing of lesson plans and approaches. The teachers will integrate Illinois-specific content information into their existing curricula and teach it to their students. Students will learn about local cultural and natural history which will help them grasp the national and global issues presented in textbooks.

**Ability to Serve as a Model**

MuseumLink serves as a model partnership that links state government, museums, schools, and local communities through the NII to co-develop state-specific, online, interactive, multi- disciplinary resources that cover cultural and natural history. It combines the missions and educational objectives of a State Museum and a State Board of Education to reach statewide audiences of teachers, students, and the general public in formal and informal settings. It builds on existing state telecommunications networks and educational initiatives to benefit underserved school districts and communities and creates two-way interactions between educators, content experts, and end users of all ages. It builds electronic bridges to groups who do not have immediate access to large museums and well-equipped schools, yet offers more than a virtual museum tour. It promotes Internet use by providing rapid access to interactive, state-specific curriculum and community resources. It fosters a sense of

stewardship in end users toward their community and provides a local framework for the understanding of national and global issues. It offers access to museum collections, experts, and data that illustrate the cultural and natural history of the state. These unique multi-disciplinary resources are not available in most schools or small communities. MuseumLink reaches out to two different pools of end users: (1) underserved K-12 students, their families, and their teachers, many of whom are unable to visit the ISM's regional locations, and (2) the underserved local public-citizens living near ISM sites who for a variety of reasons do not or cannot visit the site. By working directly with end users (teachers, students, and communities), Web development teams provide essential materials that supplement and complement existing curricula and meet community needs. Online advisory and discussion groups will facilitate communication and a sharing of ideas and success stories. Teachers, students, and local communities will become part of a life-long learning network with the ISM as a cyberspace community center. Three FreeNets (public access community computer systems) exist in Illinois: Prairienet (Champaign/Urbana), Heartland FreeNet (Bloomington/Normal, Peoria, and Springfield), and NorthStarNet (North and Northwest Chicago suburbs). FreeNets provide end users with e-mail and Internet access as well as the opportunity to place Home Pages on the Web. The flow of information is generally one-way and passive. MuseumLink differs from the Freenets in that it is an active, dynamic two-way flow of museum-specific information between the project and its end users that uses e-mail, discussion lists, and videoconferencing forums. MuseumLink differs from other TIIAP-funded museum projects such as Los Angeles CUSD'sVideoPeriscope in that it is statewide and not focused on just a single metropolitan area. While one of MuseumLink's target schools is in Chicago (May Community Academy), the rest are evenly distributed across Illinois. MuseumLink also encompasses more content areas than other TIIAP-funded museum projects such as the Denver Public Library's, and targets both the underserved general public and underserved K-12 school audiences. MuseumLink differs from library and archive-located public access terminals in Illinois in that the resources to be accessed relate to ISM themes, underserved audiences are the primary target (versus regular users of the facility), training will incorporate multiple approaches, and the end users will have a say in Web product development. With the unique resources of the ISM and ISBE, and the project's focus on the educational needs of the State of Illinois' underserved populations, MuseumLink is a model for other museums and state-level boards of education in the United States to replicate.

## PROJECT FEASIBILITY

### Technical Approach

(1) Internet Systems. The MuseumLink project will use Internet Information Servers and networks at the ISM and the ISBE and will support classroom and community access to technology, the Internet, and newly developed curriculum and community resources at underserved schools and 3 ISM facilities. Since 1994, Illinois has invested over $20 million to upgrade K-12 learning technologies. The Legislature appropriated $15 million for technology for the 1995-1996 and $30 million in the 1996-1997 school years, which enabled the ISBE to establish a statewide computer network and seven regional Technology Learning Hubs. The Hubs form a statewide support network for school districts and offer classes, workshops, network design, technology planning assistance, and connections to other facilities. Technology training for the MuseumLink project will take place at the Hubs or at Regional Offices of Education (ROE). MuseumLink, through a formal partnership with the ISBE, ties into the existing ISBE Wide Area Network (WAN), for Internet access. The ISBE WAN includes T1 connections to all of the 45 ROEs. Schools are being linked to these ROEs with robust connections. The system is designed with interoperability and scalability in mind and can easily accommodate growth through the addition of schools and classrooms. MuseumLink expands the system by providing connections and computer/software packages for classrooms at twelve underserved schools. The connections and computer packages are identical to those provided as part of the ISBE's 1995-1998 Museum in the Classroom project. Classrooms in these underserved schools will get powerful computer and software packages, including digital cameras for image capture for developing Web pages and educational projects, and a FlexCam Integrated Color Camera for videoconferencing with other schools and the ISM ( App. B). MuseumLink complements major ISBE initiatives, follows their approaches, and helps fulfill their initiative to provide strategic technology resources for economically challenged schools.

The ISM has a Class C Internet domain and is connected to the State's Department of Central Management Services via a T1 line. Two IBM RISC System/6000 workstations housed in the ISM's Research and Collections Center (RCC) provide Internet access for the ISM's Springfield facilities and act as the ISM's Web servers. Hardware resources include six workstations (IBM, Sun, and Macintosh), Calcomp pen plotters, a Hewlett Packard Design Jet color plotter, and digitizing tablets. The ISM Geographic Information System laboratory permits development and overlay of computerized maps. Hewlett Packard and Nikon flatbed color scanners, a Nikon slide scanner, Apple QuickTake and Kodak digital cameras, and two VideoLab FlexCams provide the tools for capturing images for Internet exhibits. Two Power Macintosh 8500 workstations have QuickTime

Virtual Reality development software for building virtual objects and panoramas.

MuseumLink expands the ISM's ability to provide services for end users on the Web in four ways: (1) It provides public access to the Internet in three communities (at the ISM in Springfield, the DMM in Lewistown, and the SIAS/VC in Whittington) via the installation of Internet connections and public terminals in all three sites. (2) It upgrades the Web server in the RCC to facilitate increased access, database gateways and interactive programs, and expanded online exhibits. (3) It provides some hardware for Web development. (4) It expands collaboration in the development of curriculum resources with schools and teachers through advisory councils, online discussion groups, workshops, and new links to underserved schools.

**Applicant Qualifications**

The ISM and ISBE are uniquely qualified to undertake this project. The ISM brings an interdisciplinary approach to its exhibitions, educational programs, and research efforts. The physical exhibits and collections of over 8.5 million objects and specimens document the natural and cultural history of the Midwestern United States and span the fine and decorative arts, history, anthropology, zoology, botany, and geology. The ISM also holds important national and Illinois-specific databases, which are accessible through the Web site (http://www.museum.state.il.us). ISM research programs provide information for studying long-term changes in climate, environment, landforms, plant and animal populations, and human cultures. Educational programs bring the ISM's exhibits and collections to life, stimulate learning at all age levels, and share resources beyond the ISM's walls. ISM staff are experienced in working with school groups, teachers, and local communities. ISM facilities also serve as community centers for rural Lewistown and Whittington and economically disadvantaged populations in Springfield (App. A).

The ISM is a recognized leader in the use of innovative telecommunications technology as an outreach medium. The ISM Web site provides educational resources, online exhibits, online discussion groups, databases, and descriptions of ISM programs. Visits to the ISM's Web site are growing exponentially. In March, 1997 the ISM Web site received its three millionth hit (request for information). The first million hits came in 22 months. The second million came in five months and the third million came in only three months. Over 700 other Web sites link to the ISM's Web pages, making it the fifth most linked to natural history museum in the country.

The ISM has aggressively expanded outreach to teachers and students through school partnerships and telecommunications technology including online videoconferencing. Ongoing educational programs show the innovative, multi-faceted approaches that the ISM has taken to reach students, teachers and the public through distance learning technology (App. C). MuseumLink will allow the ISM to expand these experiences and to continue providing educators with essential information for school curricula. MuseumLink will also serve the information needs of the general public as they pursue lifelong learning.

The ISBE's Illinois K-12 Information Technology Plan (App. D) is nationally recognized and demonstrates their commitment to the use of technology and telecommunications to improve student learning. The legislative appropriation for the 1996-1997 school year supported the activities of the seven Learning Technology Hubs; affordable connections to the Internet through the Linc-On state data network; participation by 500 classrooms in learning networks as part of Museum in the Classroom, EnergyNet, IllinoiSPIN, and Tried and True programs; development of community-based technology plans for 72 economically challenged districts; "Building Based Technology Grants" for 135 districts; and integration of technology into the state Academic Standards.

Dr. Bonnie W. Styles (ISM) will direct the overall project and Penny Kelly will direct the ISBE portion of the project. Dr. Styles is the Director of Sciences for the ISM. Her qualifications for this project include: directing the ISM's Information Systems; leading content teams for anthropology and natural history exhibits; writing popular and scholarly publications on Illinois cultural and natural history; directing scientific literacy workshops for elementary teachers; and co-directing the ISM-Brookfield Zoo Museum in the Classroom project. Penny Kelly is the Principal Consultant for the ISBE Center for Learning Technologies. Ms. Kelly coordinates technology grants and projects and provides assistance to schools in the use of learning technologies to improve student achievement. She coordinates the ISBE's Museum in the Classroom statewide initiative. She will oversee equipment purchases, network installation for the classrooms in the twelve schools, and technology training workshops. Resumes for the project directors and key personnel are attached (App. E, see also budget narrative for other participants).

**Project Implementation Schedule**

This project will start in October 1, 1997 and will be completed by September 30, 1999. Two teams -the Art/History team, and the Anthropology/Natural History team-will work on different aspects of the project. An Internet specialist, educators, and content experts will be part of each team. Specific tasks are listed in the time-

line (App. F). Milestones are: press conference announces award of TIIAP grant and front-end evaluation (11/97); hardware, software and Internet connections installed in targeted schools and ISM facilities (12/97); technology training workshops given for targeted schools (3/98); public access workshops offered at three ISM sites (8/98, 10/98 & 1/99); sample online curriculum resources released on Web (12/98); revision and completion of online resources (6/99); programmatic workshops presented to teachers (8/99); evaluation completed (9/99); marketing brochures and summary articles disseminated (9/99).

**Sustainability**

Because MuseumLink builds on major state government, board of education, and museum initiatives, and enlists community participation and support, continued network maintenance and expansion of resources and audiences are assured. Letters of commitment from ISBE Technology Hub directors involved with the project are attached (App. H).

## COMMUNITY INVOLVEMENT

**Partnerships and Community Support**

MuseumLink partners the ISM (including facilities in Springfield, Whittington, and Lewistown) with the ISBE. Since 1989, ISBE has provided funding to the ISM to provide training and curriculum resources to elementary teachers through the Scientific Literacy program. The ISM has also partnered with the ISBE for the Museum in the Classroom technology initiative, which Dr. Bonnie Styles and Beth Shea, Education Chair, helped develop.

The ISM has a solid history of working with school partners in previous scientific literacy initiatives and current projects (App. C). The ISM is presently partnered with twenty-five schools, statewide, for its Museum in the Classroom project. The Wetlands Scientific Literacy project involves partnerships with 150 teachers of grades 5-8 representing schools from across the state. The ISM worked with over fifty schools for the At Home in the Heartland Online project, funded by Ameritech. Additional business community support for the At Home project was provided by Springfield Clearinghouse (a consortium of banks) and Horace Mann Companies. The ISM is involved in unique collaborative efforts with the Brookfield Zoo (Museum in the Classroom) and the National Center for Supercomputing Applications (RiverWeb™ Project and the Illinois Learning Mosaic).

Project development will be guided by diverse sectors of the community through participation in formative evaluation to include focus groups, online surveys, and interviews (see Evaluation below). Teachers and students from underserved schools will be actively involved in project development.

The ISM will contribute to the project the established technological framework of its server and Web site. Other in-kind resources include salaries and benefits of key staff, monthly line charges, hardware (computers, scanners, digital camera, etc.), and software. Benefits will include an upgraded server and robust Internet connections for DMM and the SIAS/VC, which will in turn provide faster connections for end users. The ISBE will contribute the services of its existing institutional framework of 7 statewide Regional Technology Learning Hubs and 45 Regional Offices of Education to the project. The ISBE, using compiled demographic information, recruited target school partners for the project (App. A). ISBE regional facilities will serve as training centers for project participants. ISBE in-kind resources include time and benefits for key project staff (Penny Kelly and technology trainers from George Luginbill & Associates, Inc.). A letter of commitment to the partnership is provided by Cheryl Lemke, ISBE Associate Superintendent for Learning Technologies (App. H).

**Support for End Users**

This multi-faceted project is designed to support a variety of end users including (1) twelve underserved schools, (2) students and teachers in grades K-12 in Illinois, and (3) local communities and visitors to the ISM's facilities in Springfield, Lewistown, and Whittington. Classrooms in 12 underserved schools will receive powerful computer/software packages, Internet connectivity, and technology training. The twelve schools will collaborate with MuseumLink staff in the development and testing of these curriculum resources. Programmatic training in the use of the online curriculum resources will be available to all interested teachers statewide. Evaluations from previous training sessions and workshops with K-12 teachers and students documented a need for Illinois-specific information to supplement curricula and spark an interest in local environments, history, and communities. MuseumLink has the potential to provide Illinois-specific curriculum resources for over 2 million Illinois K-12 students.

Internet training at the ISM, DMM, and the SIAS/VC will reach underserved audiences. Springfield has a large, urban-underserved component and is surrounded by rural communities with populations of 1,000-3,000. DMM, located in Lewistown (population 2,572), is proximal to small towns with populations less than 225. Whittington

has a population of less than 225 individuals and the SIAS/VC serves other small communities in southern Illinois. Public access workshops at these sites will introduce visitors to the wealth of information available on the Internet and engender a public commitment to the use of telecommunications technology for lifelong learning.

**Privacy**

Curriculum and other resources developed and served by this project are for public consumption and are not confidential.

## REDUCING DISPARITIES

**Disparities in Access and Use of the Internet**

The initial beneficiaries of MuseumLink are representatives from the most underserved schools and communities in Illinois. In 1995, the General Accounting Office of the U. S. Congress reported that 60% of Illinois schools "lack six or more technology factors necessary to reform the way teachers teach and learners learn." Less than one-third of Illinois schools provide student access to the Internet and most of the computers in Illinois schools are not up-to-date. However, the student-computer ratio in schools in economically advantaged districts (10% of Illinois schools), is more than twice the national average. The disparity in the access to technology and information in the state is great.

**Strategies for Overcoming Barriers to Access**

In recognition of the disparities, the ISBE initiated a program to help economically disadvantaged schools develop and implement a community-based plan to provide strategic technology resources to prepare students for the Information and Technology Age. MuseumLink furthers this initiative in two ways: (1) It targets twelve underserved schools. (2) It provides community access to technology and information in three ISM facilities. All of these facilities serve as centers for small, rural populations in the surrounding communities and Springfield also reaches an urban, underserved population.

MuseumLink is designed to grow. The ISM's vision is to remain at the forefront of technological advances to deliver Illinois-specific information to students, teachers, and the public. ISM will use its resources to expand MuseumLink and advance public education through distance learning technology.

**The Need for Federal Support**

ISBE initiatives support Internet connectivity, technology upgrades, and training for public schools on a competitive grant basis. Federal support is needed to (1) ensure that underserved schools have access to telecommunications technology, (2) ensure that when schools access the Internet they have positive interactions with engaging learning resources, and (3) share these resources with a broader community. Given ISM staff commitments, distance learning initiatives must be supported by grants. Such funding provides critical resources for the establishment of public access terminals; and the co-development and presentation of high quality Web resources on the cultural and natural history of Illinois to meet the needs of teachers, students, and the general public.

## EVALUATION AND DISSEMINATION

**Evaluation Design and Qualifications**

Key personnel will meet monthly to monitor and evaluate the project's progress. Dr. Deborah Perry, Director of Selinda Research Associates and a professional evaluator experienced in the assessment of museum and online projects, will conduct the external evaluation. One of the first steps will be to refine the detailed three-phase evaluation plan: (1) the front-end phase, which assesses needs, wants, and pre-existing understandings; (2) the formative phase, which focuses on the successful use of the technology and the acquisition of concepts; and the (3) summative phase, which documents and describes the ways and extent to which MuseumLink is used among its target audiences. On the content level, evaluation will measure how well the subject matter and activities relate to K-12 curriculum needs (e.g., promoting a better understanding of the diversity of nature and culture in Illinois, improving verbal and nonverbal communication skills, enhancing conceptual and problem-solving skills). On the level of communication and design, evaluation will measure how well the format communicates and retains end-user interest. Evaluation will also assess the effectiveness of MuseumLink in helping children improve their research, decision making, and Internet skills.

There will be a close and collaborative relationship between the evaluator and the development team to allow active and on-going communication between the audience and the museum throughout the project. The evalua-

tor will work closely with project staff to finalize evaluation instruments which will incorporate a wide variety of approaches including online questionnaires, classroom and museum observations, and interviews. Focus groups of teachers, students, and the public will evaluate training sessions and online information and learning activities produced for the ISM Web site. Their responses will help direct ongoing training and Web site development. Results will be analyzed and a report with statistics (where applicable) will be provided.

**Dissemination**

Information about the project will be disseminated in a variety of ways including postings on the ISM Web site and online discussion group, and announcements and reports on other bulletin boards and news groups, especially those for museums and/or educators (e.g., Museum-list, MuseumEd-list, ArtsEdnet). Presentations will be offered for the annual meetings of the American Association of Museums, the Midwest Museums Conference, the Museum Computer Network, Visitor Studies Association, and at teacher institutes and various teacher resource centers in Illinois. Articles will be written for journals that feature museums, education and the Internet such as Museum News and Educomp. MuseumLink will be promoted through distribution of press releases, press packets, and press conferences. A promotional brochure will be mailed to 10,000 teachers statewide.