

Multi-lingual Digital Library for West African Sources

Description of the Project

Research teams at Michigan State University (MSU), including *H-Net: Humanities and Social Sciences OnLine*, the *African Studies Center*, and the *MSU Library*, and in Dakar, Senegal at the *Institut Fondemental d'Afrique Noire (IFAN)* and the *West African Research Center (WARC)*, seek to develop a multi-media digital library of West African sources in multiple languages. This Multi-lingual Digital Library for West African Sources (MDL-WAS) will benefit scholars and students conducting research and teaching about West Africa as well as teachers and students of African languages in both the United States and West Africa. It also will provide a valuable model for creating and distributing a diverse array of materials in a region with very limited electronic connectivity.

This project will select a full range of materials that encompass diverse formats as a testbed to develop and test systems that require solutions to problems such as digitization and searching multi-lingual oral materials and texts, copyright and economic rights across national boundaries, and distribution of digital library materials in a Third World regions where there is limited connectivity. The number of collections and items selected from them will be restricted deliberately in this early phase of the project. Funding will be sought from other sources to expand upon this research project and build a large online multi-media collection.

In addition to providing salary for researchers and administrators of this project, IFAN is applying to the International Development Research Centre of Canada through its Senegalese office to fund the African portion of this project.

The Needs for this Project

The value of developing an international digital library for West Africa sources derives from a constellation of needs of scholars and other learners.

Africa's needs for electronic connectivity and information technology

Africa's information technology (IT) needs are daunting. Faced with the spread of IT around the world and a growing transformation of knowledge, access, and of education itself, Africa is at a serious disadvantage. With 12 per cent of the global population, Africa has only two per cent of its phone lines, and it has the highest line installation costs in the world (Hall, ND).

As David Nostbakken, Executive Director of WETV and Shahid Akhtar, Director of the International Development Research Centre, have noted: "Of all the gaps that exist between the South and North, none is growing faster than the information gap, and the information highway threatens to increase the growth rate to the point where some countries and some segments of society ___ in both South and North ___ may be left out altogether" (Baranshamaje et al, 1995).

In the face of these dire needs, Africa is seeking to reduce its IT shortfall. Indeed, while the Internet scarcely touched Africa in the early 1990s, by 1998, only Eritrea, Libya, and Somalia were without coverage, and the first two plan to connect in 1999. Ten countries, including seven West and North African francophones (Burkina Faso, Gabon, Mauritania, Niger, Senegal, Chad, and Tunisia), have decided to provide local call Internet access across the whole country (Jensen, 1998)<http://www3.sn.apc.org/africa/afstat.htm>.

According to the United Nations Development Program, there were more than 100 initiatives dealing with Internet connectivity for Africa in 1997 (Dandjinou et al, 1997). The top priority of the core program of the Association of African Universities for 1997-2000 is to create regional training and research

networks through African scholarly institutions (Babou, 1999).

Africa's increasing connectivity has brought little innovation in academic uses, however. The first use generally is for connectivity with colleagues and institutions abroad through e-mail. This is an important use, because poor and very expensive phone and fax facilities often have isolated the African university and its scholars from collaboration abroad. In 1998, there were more than 100 listservs concerning Africa (which require only an e-mail connection), but only a few are based on the continent. A few non-commercial websites have provided information on African universities and non-governmental organizations (NGOs) as well as some scholarly organizations (e.g. Association of African Universities, CODESRIA, OSSREA), but, outside of South Africa, there has been little indigenous innovation in using connectivity for research.

The next step in developing information technology for the African scholarly community is to create digital collections of scholarly materials which will dramatically increase the flow of information from, to, and throughout Africa.

Preservation of materials held in West Africa

Many of the print materials held in West African collections, particularly older historical manuscripts, are deteriorating rapidly. Some materials cannot even be consulted by researchers for fear of accelerating their decline. Many research institutes and libraries, including IFAN, have suffered from deep funding cuts since the 1960s, and collections of all kinds have not been adequately maintained.

Preservation is central to maintaining the quality, longevity, integrity, and accessibility of data. Digitization can be used to create a high-quality copy of an item, thus protecting the original and ensuring that the information that it contains is both permanently preserved and made accessible.

Repatriation of scholarly materials

Repatriation of research and cultural materials to their countries of origin is a growing demand from African scholars and international organizations such as UNESCO. Digitizing and making accessible research materials, particularly interview tapes, will respond to this call. Copies of some tapes made in Senegal have been given previously to institutes in Dakar, but local environmental and security problems have since eroded the collections. Repatriation in digital form will not only return these materials to their place of origin, but will make it possible to guarantee the continuing presence of accurate copies. Developing digital collections will ensure that scholars around the globe have access to important research materials in Africa.

Scholars' need for oral sources

The oral collections will be particularly important to historians of West Africa because, in many African societies, locally-generated written historical sources are rare, and some African languages for many years had no scripts. In the 1960s, prominent Africanist historians Jan Vansina and Philip Curtin set methodological guidelines for creating oral archives, stressing the obligation of scholars to deposit copies of their tapes and other research data in the country where it was collected (Curtin, 1965). Creation of the MDL-WAS is one way to address this need to repatriate original research materials in the digital age.

Needs of African language teachers and learners

The collection and digitization of material in African languages will be particularly useful to teachers of these African languages in both the U.S. and West Africa, making this digital library useful both to researchers and classroom teachers. Knowledge of these languages is key to high quality social science, economics, and humanities research in Africa - and for dealing with the issues of education, health, food production, and development in general.

In the U.S., it has become standard practice to expect PhD dissertation candidates to master at least

one African language for their field or archival research. Thus, graduate students and faculty preparing to conduct research in West Africa need African-language materials to improve their language skills. There are crucial lacunae in the teaching materials for intermediate and advanced levels of many of the highest priority 28 African languages, including in Wolof and Pulaar, the two African languages included in this proposal.

In West Africa, there is a rebirth of interest in teaching national languages, both for literacy for the population at large as well as for scholars seeking to understand oral and written materials in the vernaculars of the region. The “graduates” of literacy programs rarely find original or translated materials in their mother language with which they can continue to develop their reading and writing skills.

Significance of the Research

This project will create a multi-lingual information system that includes sound, text, and image content from multiple countries that will be freely accessible over the Internet in the U.S., West Africa, and throughout the world. The region has very limited connectivity and a small number of people trained in creating or using digital information systems. The collection will include very diverse materials (described below) that will be exciting to scholars and students of West Africa and teachers of African languages as well as challenging to researchers in digital information systems.

Issues of poor connectivity in Africa

The focus of this project on West Africa poses special challenges in dealing with the low level of connectivity and the limited training of collaborators to create the digital library system and make it accessible to potential users in the scholarly and educational communities. West African universities, libraries, and scholars all recognize the unparalleled potential of the Internet to provide both access to resources for teaching and research and an avenue for scholarly publication. To date, however, the hurdles of scarce economic resources, a weak information technology infrastructure, and lack of experience with digital systems, have swamped most efforts to develop digital library resources in the region. Building on existing scholarly collaborations and a mutuality of interests in preserving and accessing this material, this project aims to develop models for multinational collaboration and strategies for overcoming connectivity inadequacies that allow for further capacity building.

Issues of cross-cultural collaboration

This project will pose interesting practical and research questions about collaborating on international digital information systems in a cross-cultural context. Researchers and librarians in both the U.S. and West African countries value collecting and providing access to research materials, but the organizational structures within which they operate are quite different. Communication between research partners in French and English will be facilitated by bilingual speakers and people who can provide translation for partners on either team.

Higher education and research institutes in West Africa are built on a more hierarchical model than those in the United States, and the methods of decision-making and time required for it vary in the two systems. Also, the research teams will confront a heritage of inequality between the two world regions. The financial resources and facilities available to the two research teams also differ enormously, which may lead to different interests on issues of intellectual and economic rights.

There is a history of grave concern on the part of African colleagues about historical and cultural materials that have been taken from their countries. Debates in international organizations in which scholars and government officials from both countries have discussed standards for the disposition of intellectual and cultural materials will provide useful context for the decisions on these issues that will arise in the project.

Issues of digitizing audio materials

The digitization process for voice and other audio materials that will be used for this project is still under development. MSU Library is working with the Council on Library and Information Resources and a number of other partners to develop a recognized set of "best practices" for preserving sound in digital formats. The MDL-WAS project will work with that group and implement its recommendations. MSU's Vincent Voice Library has been building experience in voice digitization and preservation thanks to an NEH funded H-Net proposal for digitizing historical voices in a format conducive to classroom use. Preferred sampling rates, storage formats, and sound clean-up procedures evolve over the next several years because of research in which the MSU Libraries are integrally involved.

Issues of intellectual property and economic rights

The MDL-WAS will offer opportunities to explore intellectual property (IP) issues that particularly affect collaboration between researchers in the U.S. and Africa. As Professor Djibril Samb, the director of IFAN, one of the project partners in Senegal, has pointed out, "One of the central concerns is that this project address the subject of property rights as it relates to the protection of economic rights, which is linked to the question of where the main data storage is located, the accessibility of the data, and even problems of sovereignty." Sharing of scholarly information between Americans and Africans also is particularly sensitive because of the history of many research and cultural materials being taken from Africa by foreign researchers. The enormous inequality in the flow of global electronic information raises particular challenges to designing the structure of any international digital library that involves African and American partners.

IP issues stand at the heart of any international digital library project, posing complex questions about which little research has been done. Although they must be handled as strictly legal questions, IP issues reach beyond the courtroom into the range of assumptions that partners from different societies make about their shared intellectual products and their economic rights. IP issues affect interoperability, administration, maintenance, and ultimately the long-term use, ownership, and viability of the collection.

The divergent backgrounds of the two legal systems are important to understand. Although the U.S. and Senegalese IP systems have many common elements because of treaty memberships (including WIPO and GATT), they start from quite different legal traditions (NAFTA and GATT, 1994). The U.S., for example, treats copyrights almost entirely as economic rights and allows corporate entities most of the same rights as individuals. Senegal's French-based system distinguishes between economic exploitation rights and moral rights, which are inalienable from the individual human creators (Ploman, 1980, pp. 108ff). Other differences arise from economic needs of first-world information exporters versus third-world information importers.

Research concerning IP requires a testbed of concrete examples; abstract legal research has little value. Application of statutes to the details of particular cases transforms the statutes into a form of law that governs actions and relationships. These testbeds of text, sound, and image materials promise particularly rich cases.

The MDL-WAS will offer opportunities to examine IP issues for a cooperative project involving the leading states of francophone West Africa, focusing on Senegal. Current information about IP rights in Senegal is scarce in the U.S. Project partners will consult experts and practitioners such as officials at the Conseil superieur des Archives. A project in which the Senegalese partners have clear IP interests in copyright and economic rights, as IFAN has expressed, will provide an excellent source of current legal information that could interest commercial firms selling databases or technology as well as scholars. We also will deal with the issue of gaining permission of informants and collectors for inclusion of interviews, photos, and other materials in a digital library accessible to scholars and students.

Plan of Work

Identifying collections of materials for the MDL-WAS

The MDL-WAS will contain four discrete types of materials that encompass a full range of diverse formats which are not now accessible to most researchers of West Africa.

The materials to be digitized initially for the MDL-WAS will be selected by partners in both Senegal and the U.S. Documentalists at IFAN led by Gora Dia, head of the library, will take the lead in identifying groups of manuscripts, tapes, visual images, and texts from the Oral Data Collection, the Phototeque and the Department of Islam. In the U.S., PI David Robinson will identify collections of oral data and images compiled by American Africanists who have worked in francophone West Africa during the past 40 years.

There will be four types of collections included in the testbed for the MDL-WAS:

1. *Manuscript collections housed in the Library and the Department of Islam at IFAN* - Almost all of these collections are unique, unpublished materials that exist in no other form in any location. These materials, from throughout West Africa, mostly in French or Arabic, date from the 19th and 20th centuries. IFAN is the richest repository of such materials in francophone Africa. At its inception in 1939, it inherited documents from earlier public and private repositories.
2. *Oral sources in the African languages of Senegal* - Oral materials will be selected both from collections at the Dakar-based partners and from selected American scholars who have conducted research in West Africa. Diverse materials from a vast array of sources will be selected. Examples include official speeches by political leaders (located in West Africa), interviews with local informants conducted by scholars (in private collections of researchers in the U.S. and West Africa), and talk shows in (urban) Wolof from radio stations in Dakar and from the program "On African Time" broadcast in New York City (in a personal collection of a professor at the International Literacy Institute at the University of Pennsylvania). African languages included in the oral collection will be limited to Wolof and Pulaar in this stage of the project. By being included in the MDL-WAS, some oral materials will be repatriated to West Africa.
3. *Images originating in francophone West Africa* - Some materials will be selected for digitization from IFAN's Photo Library of 60,000 items from the beginning of photography to the sketches and engravings of European and African explorers of the last three centuries. This collection is little known outside of Dakar, or indeed beyond IFAN itself. Selected images from photographic collections held by American Africanists in such areas of visual arts, sculpture, dance, religious rituals, architecture, dress, and jewelry from Mali, Burkina Faso, Togo, Cote d'Ivoire, Senegal, and Dahomey will be included as well. Images of these objects are particularly valuable to museums and scholars in West Africa because many of the objects that were photographed have disappeared or have been sold to European and North American entrepreneurs. Digitizing this image material will contribute to the objective of repatriating materials to their country of origin by making them available online in Africa.
4. *Texts in African languages* - We will select some older texts, such as those found in collections in the Department of Islam of IFAN and some more contemporary materials that have wide currency. At this stage of the project, texts will be selected in Wolof and Pulaar from the numerous African languages used in West Africa. Some of these texts are written in Roman script while others are written in Arabic script. "Ajami" and "Wolofal" are the names given to texts written in the Arabic script in Pulaar and Wolof, respectively. The Arabic alphabet was used for transcribing many African languages in the northern half of the continent for centuries before European influence became dominant. While Roman script is still the dominant, Ajami and Wolofal are gaining currency and are used in some areas for such purposes as health education pamphlets, advice columns, poetry, and "how-to" documents explaining, for example, how to build and maintain a well, or how to defend yourself in a French court system, especially for people whose literacy is limited to the Arabic script. In addition to selected available texts, some oral materials in Wolof and Pulaar (see Section 2, above) will be transcribed in Roman script with translation in English or French.

Digitizing the materials

Digitizing materials for the project will take place in both the U.S. and Africa following established "best practice" procedures whenever possible. MSU has provided and programmed a server and computer work stations at WARC, which also will assist in the digitization, and will provide training in the digitization process. IFAN is seeking funding for digitizing equipment as part of this project.

Both text materials and photographs will be scanned using robust and inexpensive Hewlett Packard flatbed color scanners. Color scanning is preferred so as to preserve as much of the look and feel as possible, and, for text, to have maximum information for future Optical Character Recognition (OCR) programs. The irregularity of electrical power, connectivity, and environmental control in a Third World environment could prove challenging.

Some text materials in Western scripts may be re-keyed using dual typists and comparison software. These materials could then be coded in either SGML using a TEILite Document Type Definition, or in XML, once commercial browsers have been adapted to read it. Converting the TEILite SGML to XML should be trivial as long as the marked-up text validates cleanly in Interleaf's Author/Editor, which is MSU's SGML editing package. The enhanced search capabilities of SGML/XML make this conversion desirable, but in the early stage of the project cost will permit us to do this conversion only for selected items of high interest and importance.

Limited text materials in Arabic script also will be re-keyed and marked up in SGML/XML using the Unicode character set. This is important because of the notorious unreliability of transliterations for searching, even in fairly simple situations such as author names in a catalog. Relatively little work has been done in this area, and technical procedures will have to be developed.

Electronic cataloging of the collection

Careful attention will be given to providing metadata that describe the provenance, information contents, and place of origin of the items that are digitized for the MDL-WAS library. In a networked environment, metadata is essential to help users find, evaluate, and use digital materials. This project will use conventional library cataloging, the most traditional form of metadata, as well as metadata which is appended directly to the document and thus remains with all copies. (Caplan, 1995)

Building the right type of metadata with the appropriate granularity will facilitate access across multiple formats and languages. This project will use three types of metadata, each of which allows some variation in the form and detail of the information it carries, but which can also be converted to and from each other with widely available programs and only minimal unique coding for non-transferable features. Standard US MARC records will describe the digital artifacts in a separate "view" of the MSU Libraries' Innovative Interfaces Inc. on-line catalog, and (with appropriate modification) the MARC records can also be incorporated in the catalogs of partner institutions in Senegal. This will allow searches across the entire collection. Dublin Core metadata will be attached to digital artifacts which must be accessed through HTML. This includes image files for text and photographs as well as sound files. Text Encoding Initiative (TEI) headers will provide metadata for works in SGML or XML. This multi-format approach provides maximum coverage for different types of search engines at little cost, thanks to the automatic conversion tools. (Vellucci, 1997)

The multiple-languages interface will use the metadata both to identify the language of an object, and to obtain information about that object through the use of standardized subject headings in the original language (whenever possible) as well as English. SGML/XML Unicode options should allow Arabic text to be searched directly without awkward transliterations. (MacDougall, 1997)

Both MARC and Dublin Core are international standards that assure consistent bibliographic record structures for effective retrieval (USMARC, 1994 ; OCLC, 1997). Substantial progress also has been made in standardizing TEI headers for SGML/XML (*TEI Guidelines...*) Name authority records will be

consulted to assure consistent forms of personal and corporate names.

Delivery of the collection in Africa and the U.S.

Delivery of a digital collection in an environment of extremely limited network capacity is one of the key challenges of this project. Connections from Africa to the rest of the world are fairly narrow, and infrastructure in West African countries is nearly nonexistent. Dialup service is often very expensive due to the high rates charged for telephone calls.

The research team considered three architectures for delivery of the MDL-WAS collection under these constraints. Option #1 would place the server and storage for this archive in Senegal. We concluded, however, that not only is the cost of creating and maintaining a large online multimedia database in Senegal prohibitive at this time, but also that bandwidth limitations would severely hamper the usefulness of such a system beyond its host institution. Option #2 would place the server and storage at MSU. Given bandwidth problems, however, this would make access from Africa too slow and unreliable. An exclusively MSU-centered delivery system is politically and culturally not feasible and undesirable.

Option #3, in contrast, would utilize storage located at MSU and would place caching proxy servers at various locations in Senegal and elsewhere in West Africa to reduce utilization of scarce bandwidth. Option #3 is the clear choice because it meets both bandwidth and budgetary constraints. Using this approach, the MDL-WAS benefits from coordination with other projects. A large storage farm is being created at MSU for digital library uses. A relationship has been established with UCAD in Senegal which will allow good network connectivity to be established with WARC and IFAN via radio links. Other sites, both in Dakar and throughout West Africa, can be added to this system. The additional challenge of managing computer systems across many time zones and great distances can be alleviated by cooperation with staff in Senegal who have received some training from MSU staff and will receive further training using resources from MSU. MSU'S extensive experience in managing caching servers throughout the state of Michigan is particularly valuable in this enterprise. Moreover, Option #3 allows for future development of broader computing capacities amongst our partners in Senegal because these caching servers can be upgraded to full mirror sites when this becomes economically and developmentally feasible.

Use of the collection by scholars of Africa and African language teachers

Developing an architecture and delivery system for digitized scholarly material about West Africa will create the possibility of establishing a growing new source of valuable materials for researchers from humanities and social science disciplines. Some of the materials drawn from private collections will never before have been available to other researchers. Other materials from research institute collections will be preserved and will become available to many more researchers.

This project will make accessible texts of Wolof and Pulaar that can be used for language learning in both the U.S. and West Africa. In the third year of the project, a language pedagogy specialist will be hired to design curricular materials for advanced African language instruction that use selected textual and oral items in the MDL-WAS collection. These curriculum designs also will be made accessible via the MDL-WAS. Serving the educational needs of these very different constituencies on the two continents is an exciting benefit of this project.

In order to maximize the use of the collection, both research teams will widely disseminate information about it at conferences, through scholarly journals, and on the Internet. When some materials in the MDL-WAS are available to be accessed, notice about MDL-WAS and an inventory of the collection will be distributed to relevant scholars and research institutes in both regions.

In West Africa, WARC, one of the two African partners in this project, is itself a vehicle for distributing information about the collection through its committees in several countries. The H-Net African discussion networks, especially H-West Africa, are another obvious and effective way to inform Africanist

scholars in both regions about the collection and its potential usefulness to them. H-Net's wide distribution to African studies scholars will ensure rapid dissemination of information about the project.

Information also can be disseminated through the Council for the Development of Social Science Research in Africa (CODESRIA), located in Dakar, is a key organization that promotes the study of social sciences in Africa. The Association of African Universities (AAU) will take an interest in this project, given its current priority on creating regional training and research networks through African scholarly institutions.

In the U.S., the West African Research Association (with which WARC is affiliated) and the Association of African Studies Programs are avenues of informing scholars about this project. Several regional studies associations that include African and American Africanists also can be used to inform potential users of the collection. These include the African Studies Association, the Mande Studies Association that focuses especially on Mali, and the Ghana Studies Council. Information about MDL-WAS can be submitted to numerous websites based in both the U.S. and Africa that provide information about research collections on Africa.

This project will link with other recent promising endeavors to share information about archives of African materials. African Research Central (ARC), was launched in January 1998. Its website (<africa_research.csusb.edu/>) is maintained by two scholars at California State University San Bernardino and linked to H-Net. The ARC has created a directory of 90 African repositories of data, information about North American and European institutions with important African holdings, and "access reports" by scholars on archival collections. It also hosts a discussion forum about research issues in Africa.

The Senegal Project launched in 1996 by the Title VI African Studies Centers (including the ASC at MSU) and run by the Archives and Library Committee of the African Studies Association is another such project. In this effort, led by Columbia University and its Africana librarian, an important series of materials on education in French West Africa is being microfilmed at the Senegalese National Archives and made available to scholars in West Africa and the United States.

Continuation and possible expansion of the project

When this project is completed and the research problems concerning the technologies for digitization and retrieval of the diverse forms of materials and concerning making the collection accessible in Africa and the U.S. have been addressed, the research teams will seek additional support from other funding agencies. Such support will be used to expand the volume of materials that will be digitized and cataloged in the MDL-WAS library and assess the feasibility of expanding the library to anglophone Africa and to linking it to other databases of African scholarly materials.

Additional support will be sought to enlarge this digital repository. H-Net already is working with the Council of American Overseas Research Centers, with which WARC is affiliated, to explore the possibility of submitting a proposal to the Rockefeller Foundation for expanding the MDL-WAS collection.

Through the H-Net / MSU Internet training workshops, close ties and good connectivity has been developed with colleagues in anglophone Ghana, which could be a natural extension of this digital library. The possibility of expanding the library to anglophone African sources more broadly will be explored with The Ford Foundation, whose Cultural Affairs Program Officer is interested in projects that link anglophone and francophone Africa and in information technology.

Evaluation

We will evaluate the project in terms of both the value of the digital library for the study of West Africa and the research results concerning collaborative work to create international digital collections.

First, we will convene a panel of recognized scholars and students who conduct historical, linguistic, anthropological, or sociological research in West Africa. These panelists will test interfaces and judge the value of materials included in the testbed. Their concern will be the usefulness of the digital library for research and teaching purposes. The panel will comprise participants from both Africa and the U.S., including at least two West African scholars. This panel, of from four to eight members, will begin functioning early in the project, as soon as digital materials and interfaces become available for testing. Members will be invited to discuss their assessments via the Internet, and each panelist will be asked to provide brief reports at agreed-upon intervals focusing on questions from the project participants as well as ideas or concerns of their own. In addition to this selective panel, participants in the H-Net discussion groups on Africa will be invited to make use of the collection and share their evaluation of its contents and design.

Later in the project, when proposed solutions to the research questions are developed, we will convene a panel of experts, each of whom will be chosen for his or her expertise in areas of research concerning creating digital libraries. Members of this panel, of from three to six members, will conduct some of their discussions via the Internet and will meet at least once face-to-face to prepare a common evaluation report.

The PIs are committed to writing up the research findings from this project for submission to peer-reviewed journals soon after the project is completed

Project Partners

Research partners in the U.S. at Michigan State University

The MDL-WAS research team at Michigan State University (MSU) comprises faculty and staff at *H-Net: Humanities and Social Sciences Online*, the *MSU Library*, and the *African Studies Center* who have unique expertise in partnerships in West Africa and electronic connectivity and digital collections.

H-Net: Humanities and Social Sciences Online is an interdisciplinary, worldwide consortium of scholars and teachers. PI Mark Kornbluh is Executive Director of H-Net. A diverse organization engaged in many disparate and wide-ranging projects, H-Net has a longstanding commitment to maintaining high scholarly and pedagogical standards while increasing access and availability of resources to international scholars and students. With more than 100 networks that reach over 90 countries, H-Net is the largest distributor of scholarly electronic discussion lists in the world and hosts one of the most extensive websites in the humanities and social sciences. H-Net has created online databases, exhibitions, photo archives, educational outreach programs, and research tools.

H-Net and the MSU Libraries recently submitted a proposal to NSF to found a *National Gallery of the Spoken Word* (NGSW). The NGSW project will develop a practical, widely usable search engine for voice resources exploiting modern speech-recognition technology which will be a valuable foundation for designing the system to search the multi-lingual materials that will be collected in the MDL-WAS.

H-Net is firmly committed to reciprocal international partnerships. H-Net has developed a special focus on Africa, and it is a leader in electronic communication, training, and forming partnerships in electronic connectivity with African universities, public institutions, and governments. This work has included founding and maintaining eight African discussion lists (each of which is managed by international teams that include African editors), creating web pages, transmitting databases to subscribers and collaborators in Africa, and providing servers, computer work stations, and other equipment to institutions in several African countries.

In the summers of 1997 and 1998, H-Net held intensive workshops for African librarians, academics, civil servants, and administrators from West and Southern Africa on uses of the Internet and the World

Wide Web for research, teaching, civic education, and democratization. At these workshops held at MSU, several librarians from West African francophone and anglophone countries met for the first time. Indeed, a major finding of these USIA-funded programs was the enthusiasm among African librarians for expanding trans-national and trans-lingual connectivity.

The MSU Libraries, where Co-PI Michael Seadle is Digital Services Librarian, holds more than four million volumes, making it the 25th largest collection in the Association of Research Libraries. The library has an active text-digitization program, and its Digital Sources Center supports a wide range of projects including SGML, GIS, text, and recorded speech digitization. The Library also serves as a source of copyright information for the university community.

One of the gems of the Main Library, the Vincent Voice Collection (VVL), holds a collection of more than 50,000 audio recordings from the dawn of recording to the present and is an important pioneer in the digitization of speeches and other audio data. The Library, in partnership with H-Net, has initiated a digitization program for the original 900 hours of the VVL's holdings, and it is a major partner with H-Net in the proposal to create the National Gallery of the Spoken Word. The VVL has a rich collection of African voices, particularly of the first generation of liberation leaders, that will be a valuable part of this collection.

The MSU Library has invested heavily in Africana materials during the past 40 years and is one of the leading three Africana collections in the nation, served by at least two FTE and at times three Africana librarians. Francophone Librarian Joseph Lauer developed the *Sahel Bibliographic Project* which published the quarterly *Bulletin Bibliographique du Sahel* and microfiched and disseminated across West Africa a major collection of more than 2,200 development-related documents about West Africa. Many of these were collected in Europe and North America and then were repatriated to West Africa for the first time. Library staff have assisted in the Internet training workshops of the past three years and maintain close ties with librarians from the five African countries who participated.

For almost 40 years, the *African Studies Center (ASC)* at MSU has been a leading U.S. Department of Education Title VI-designated National Resource Center for the study of African languages and area studies. Co-PI David Wiley is Director of the ASC and president of the African Studies Association. Co-PI David Robinson is a University Distinguished Professor of History affiliated with the ASC. Since the 1960s, Robinson has developed a broad and deep history of collaboration with scholars of Senegal and Mali and is deeply respected for his reciprocity and respect for African scholarship.

With 125 Africanist faculty in all of the major disciplines, the ASC is the leading producer of new knowledge on Africa, developing more Ph.D. dissertations for the past 15 years than any other U.S. University. The Center has sustained a wide variety of linkages for research and teaching across Africa. It has been a pioneer in promoting the donation of journals to African university libraries, reviewing multi-media resources about Africa, teaching African languages, and developing African language pedagogy. The ASC has been a partner in all H-Net initiatives on Africa, including the training workshops and electronic discussion lists. The Center director also has been the area studies representative on the Mellon Foundation-supported projects of the Association of Research Libraries and Association of American Universities for increasing U.S. access to foreign scholarship and library materials.

The Center's *African Language Program* is a national leader in developing language pedagogy and materials for African languages. Wolof, Pulaar, and Arabic - the principal African languages of the materials that initially will be included in the MDL-WAS collection - are offered at MSU. Prof. David Dwyer, African Language Coordinator at the ASC, is probably the leading U.S. authority on African languages and currently is creating an on-line interactive version of his [Handbook of the African Languages](#), the definitive source of information, bibliography, experts, and teaching materials for the 83 highest priority African languages. On issues of cutting-edge pedagogy, MSU African language materials development is supported by the MSU Center for Language Education and Research (CLEAR), one of seven national Language Resource Centers in the country supported by the U.S. Department of Education.

For the past 25 years, ASC faculty have enjoyed particularly close relations with Senegal through a variety of projects in history, anthropology, economics, agriculture, education, and health fields. These included a USIA-linkage grant (1987-91) with the Université Cheikh Anta Diop (Dakar) where IFAN is located. Currently, the Center is supporting a consortial project of all U.S. Title VI African centers to preserve and microfilm historical materials at the Senegalese National Archives. Similar relations have been developed with university, government, and NGO partners throughout francophone West Africa - especially in Mali, Guinea, Ivory Coast, Burkina Faso, and Niger.

Research partners in Senegal

The MDL-WAS research team in Senegal is located at two research institutions. Founded in 1939 in what was then the capital of French West Africa, the *Institut Fondamental d'Afrique Noire (IFAN)*, is the premier francophone research center in Africa. Originally known as the Institut Français d'Afrique Noire, IFAN is the successor to a French body, the Comité d'Etudes Historiques et Scientifiques de l'Afrique Occidentale Française. IFAN holds an impressive collection of archeological data and materials in the natural and social sciences and history. After the creation of the University of Dakar (now named the Université Cheikh Anta Diop of Dakar, or UCAD), IFAN was integrated with the university.

The director of IFAN, Professor Djibril Samb, formerly of the Philosophy Department of UCAD, is an eager supporter of this project and has commissioned the head librarian of IFAN, Gora Dia, to supervise the work of selecting materials from the collections, inventorying, scanning, and digitizing to be done at IFAN for MDL-WAS. Mr. Dia, a graduate of the School of Library Science, Archives and Documentation of UCAD, was a participant in the H-Het/MSU workshop in 1998 on uses of the Internet and the World Wide Web.

The *West African Research Center (WARC)* has its headquarters in Dakar near UCAD, led by a director and local sponsoring committee (the Association de Recherche Ouest-Africaine, AROA). It has branches in Cote d'Ivoire and Ghana, and has made contact with scholars in a number of other West African countries. WARC is the only American research center in Sub-Saharan Africa. It joins older centers for North African, Egyptian, Roman, Greek, and other studies within the Council for American Overseas Research Centers in facilitating international scholarly exchange.

Oumar Ndongo, the acting director of WARC, and Madiama Mbaye, the electronics program coordinator, will participate in MDL-WAS. MSU is now installing a server and work stations at the WARC headquarters that will be linked by radio wave transmission to the computer center of the university. MSU also will install a digitalization equipment at WARC to be used for digitization of some of the materials for MDL-WAS held in Senegal. These resources will permit Senegalese, visiting American students and scholars, and others to access e-mail and the Internet and in various ways to facilitate their research, teaching and exchange of data.

WARC is the African affiliate of the West African Research Association (WARA), a consortium of institutional and individual members devoted to research on West Africa. Its secretariat currently is located at the University of Wisconsin-Madison under the leadership of Edris Makward, a Professor African Languages and Literature and a native of the Senegambia region.

IFAN is seeking funding for its activities in MDL-WAS from the International Development Research Centre (IDRC) in Canada, which has a strong interest in information technology and a long history of support for higher education and research in francophone Africa, and particularly in Senegal.

Management Plan

Africanist scholars in both countries will identify collections and select specific materials for inclusion in the digital library. This will require that research on issues of intellectual and economic rights be

carried out by both teams. Dissemination of information about the digital library to scholarly users in Africa and the U.S. will be done by both teams.

Materials located in the U.S. and West Africa will be digitized in both places. The design of the software will be done by the U.S. team and metadata will be added to the digitized materials in both locales with the guidance of an electronic records cataloger who will be located at the MSU Library. The delivery system will be designed by the U.S. partners. Creating curricular designs for use of the materials for African language learning will be overseen by the African Language Coordinator at MSU.

The U.S. partners will arrange for the installation of digitizing equipment at WARC and IFAN and will train African partners in their use. This travel and training will be funded by MSU and possibly by a grant from the U.S. Institute for Peace.

The U.S. and West African partners will be in frequent e-mail communication to discuss the progress of the project. A web-based bulletin board system will be used to track the progress of the project and provide ongoing in-depth exchanges. Real-time group conversations or video conferencing that are much more affordable than foreign travel enhance the development of and commitment to the collaborative effort by both partners. French / English translation will be used throughout the project to ensure full understanding on both sides.

Both research teams will have the opportunity to exchange ideas electronically with members of the users' evaluation panel.

The Broader Significance of the Project

Integration of Research and Education

Using the collection for teaching about Africa - The digital library of source material on West Africa is ideally suited to foster integration of research and education. Making new sources available to scholars of West Africa can enrich on-going research and also enliven classroom education. Links among related materials in the collection will enhance their usefulness for educational purposes. For example, a speech by Leopold Senghor, poet, philosopher and President of Senegal from 1960-80, could be presented with images and a transcript of the text of the speech.

The collection of oral materials will be particularly exciting to African historians for whom the study oral sources is an important component of historical methodology. The H-Africa, H-West Africa, and H-Africa Teach discussion groups hosted by H-Net, which are used by scholars in both the United States and Africa to discuss their research and teaching, will be used to encourage discussion of use of its materials for teaching.

Designing ways to use of the collection for African language teaching - The project will include curriculum design that will make the collection useful for African language teaching in the US and in West Africa. Language learners will benefit not only from reading and listening to the language, but will also gain new insights about the culture and society of West Africa. Because of the need to select textual and oral African language materials from the collection that contain the appropriate vocabulary for language teaching at various levels, the project has budgeted a staff person to select materials and design lesson plans which make use of them. This person also will disseminate information about the availability of the MDL-WAS and this language-learning feature to the African language teaching communities in the U.S. and Africa.

Creating Greater Equality of Access and Use of Information Technology

Providing user interfaces for blind persons - H-Net, the MSU Library, and other collaborators will be working on development web-based interfaces for the blind as a part of the National Gallery of the

Spoken Word project. This work will consist principally of adapting existing prototype interfaces to operate in a sound-only mode, assuming the availability of certain audio and speech-recognition capabilities at the user's input terminal. The interfaces will be designed to support a flexible array of commercially available, state-of-the-art audio interface devices. The MDL-WAS will be able to use the interfaces that are developed.

___ *Collaboration to extend capacity in information systems to an underrepresented population -* Economic inequalities and the tyranny of distance have greatly disadvantaged African Universities, scholars, and students in the 20th century world of print scholarship. During the past quarter century in particular, African libraries have fallen farther and farther behind as they have been unable both to keep up with acquisitions and to maintain their collections. As a result, faculty and students have lacked the necessary resources for research and teaching. Given this bleak situation, the equipment and training costs of digitization, information technology might seem a prohibitive luxury.

Most African scholars and librarians, including the partners in this project, feel otherwise. They recognize that even with the vast inequalities existent in access to the Internet, digitalization of resources and Internet delivery offers a unique opportunity for preservation, publication, and access. With a computer and an Internet connection, scholars and students in West Africa today have access to library resources far beyond what would ever be possible in the print libraries of their countries. What they don't have to date is the capacity to produce indigenous electronic resources.

It is therefore vitally important not only to further develop access to Internet resources in areas such as West Africa but also to include previously disadvantaged areas of the world in the design, development, and production of these new resources. Differential access to information technology and the ability to participate fully in global electronic information networks is in itself a measure of the unequal distribution of power in today's increasingly connected global economy and polity. In West Africa, there are very few people with the advanced training that enables them to contribute to new knowledge about electronic information systems. It is precisely because of this situation of inequality that Africans should be included in developing new knowledge in these areas. Indeed, excluding Africans from the development of new research on international digital libraries would further exacerbate their exclusion from this important arena. Also, it would hamper the development of new knowledge about how to create and disseminate information technology in environments where there are low levels of connectivity and users with limited training.

Therefore, creating a partnership between U.S. and West African research teams, teams from the most- and least-connected continents, for the purpose of developing new information systems is consistent with the value NSF places on broadening opportunities for diverse populations and including underrepresented groups in scientific research. The African collaborators in this project - who, as a broad group, have been underrepresented in the development of information technology - have expressed a strong commitment to this project and to expanding their capabilities in electronic information technology. In the course of the project, the African partners will receive additional training in digitizing materials, tagging materials with metadata, and in delivering the collection from a caching proxy server. The digital library will enable West African scholars and students to profit more fully from the electronic communications revolution by having access to databases critical for their research and teaching.

