

**EVI**A D i g i t a l  
A r c h i v e  
Ethnomusicological Video for Instruction and Analysis

**Project Title:** Ethnomusicological Video for Instruction and Analysis (EVI) Digital Archive Project Development Phase

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## **Summary**

Indiana University and the University of Michigan, with support from the Andrew W. Mellon Foundation, propose to develop the EVIA Digital Archive—a digital asset repository and delivery system for ethnomusicological video, supplemental audio, and text. We intend to use the guidelines fashioned by ethnomusicologists, technologists, librarians, archivists, and intellectual property experts during a year-long planning project funded by the Mellon Foundation to create a functioning digital repository and delivery system containing approximately 150 hours of digital video and accompanying metadata. Part of this metadata will include annotations and analysis of video content by the scholars who made the recordings. Using the bandwidth capabilities of Internet2, we will provide high-quality video streams to scholars for new research endeavors and to teachers for creating rich learning experiences.

## **Introduction**

More than twenty years ago, two young ethnomusicologists met in Monrovia, the capital city of Liberia, as they brushed off the dust of the interior roads they had just traveled and stocked up on supplies for the return to their field sites. They became acquainted and shared accounts of their research: Lester Monts studying changes in music in western Vai villages where Islam was spreading, Ruth Stone working on cueing patterns among Kpelle musicians further north. The moving image recordings they made have taken on immense significance as the country later plunged into nearly fifteen years of continuous civil war. Last November in Bloomington, Indiana, these same researchers shared those sounds and images with a group of ethnomusicologists, technologists and intellectual property experts brought together by a Mellon Foundation planning grant. The group quickly grasped the multiple significances of these recordings—as historical documents of cultural life now gone, as material with rich research and pedagogical potential, and as signal carriers in need of immediate preservation. Such engagement provided the rich interchange and animated productivity of the three workshops that followed where participants talked across disciplinary and technical divides and worked to develop the plan we present here. The collaboration of two scholars for more than twenty years has motivated the creation of an archive unlike any that exists—an archive that will share moving images of rich human creativity from around the world in new ways. These ethnomusicologists, technologists, librarians, archivists, and intellectual property experts are now poised to begin development of the digital archive and library that we propose.

Ethnomusicology is an interdisciplinary academic field that focuses on music for the purpose of cultural analysis. Ethnomusicologists study any music of any place or time period. Closely allied with the disciplines of anthropology, musicology, and folklore, ethnomusicologists analyze sound itself as well as look at music as one of many interrelated cultural systems. Research for ethnomusicologists may involve library or archival work, but what makes us different from many other scholars in the humanities is that most ethnomusicologists conduct ethnographic research or “fieldwork” as well. Because music events around the world rarely involve music-sound alone, ethnomusicologists attend to the multiple channels of creative communication that surround these events and thus regard video as an extremely useful research tool.

The video that will be the centerpiece of this project consists of musical performances from around the world. Musical performances at rites of passage among the Vai of Liberia, political rallies among the Kpelle of Liberia, masked dancing in the Mandingo/Dan borderland of Côte d'Ivoire, gamelan orchestra performances in Indonesia, mariachi orchestra performances along the United States-Mexican border, performances of Chinese Huar song, and polka dances in Indiana are just a few examples of the kind of documentary materials we will include. A number of the events documented are no longer being performed or have been radically altered due to war and the influences of globalization. In many cases there is no other similar document in the world. These documents have scholarly value from the perspective of musical and cultural analysis, the study of the humanities, local and national politics, historical documentation, and area studies. Not only is the material of great importance to ethnomusicologists, but it is also the kind of artistic product that generates wide interest outside of the field.

The increasing use of video by ethnomusicologists over the last 25 years has been a boon to research but has also raised some significant preservation and access issues. We see six primary areas of need within our field and in related ethnographic disciplines:

1) **Preservation.** We need to preserve moving image documents made by ethnomusicologists as part of their field research. Archives wrestle with the challenge of deteriorating media or “carriers” all the time, but videotape requires urgent attention. Initially adopted by scholars in the mid-1970s and widely employed by the late 1980s, video offered an inexpensive way to capture a fuller range of expressive culture—particularly music sound and dance—than still photography or audio recordings allowed.

Today most ethnomusicological scholars use video in their ethnographic research. A disadvantage of this practice is that videotape has a poor archival life. Magnetic particles dissipate with alarming speed as tape simply sits on a shelf. Furthermore, the friction caused by playback quickly degrades the video and audio signals. Changes are evident in the original after only 10 years of storage and analog copies show an obvious deterioration of the image quality. New digital video formats such as MiniDV offer better resolution than the analog formats used by ethnomusicologists, but it has an even briefer archival life. Some experts argue that MiniDV tape signals may be unrecoverable after 10 years. To make the situation more serious, most ethnomusicologists are keeping their video collections in their home or office rather than in archives. While these same ethnomusicologists religiously deposit their audio recordings in archives, they are holding on to their video recordings. We believe this is because of the expense of making good copies and because of the reasons detailed in our second area of need.

Some archives that contain ethnographic material also hold moving image materials and presumably these archives follow archival standards to the best of their abilities and financial resources. Thus, physical preservation exists but as we indicated before video signals degrade quickly even under the best archival conditions. The archival community is wisely conservative when it comes to adopting new approaches and standards because

efforts in the realm of digital preservation of both audio and video are still in their early stages. The archival, ethnographic, and humanities communities now need a systematic model for digitally preserving and providing access to moving image materials.

2) **Annotation.** We need to develop systems and practices for the annotation and indexing of field video. Ironically, despite the fact that video provides us with more information than an audio recording, even more information needs to be explained about a video recording, particularly in a field such as ethnomusicology where only one outside expert in a given music and cultural system may exist. Such annotation is time consuming and is hampered by the limitations of older technology. The consumer or prosumer formats typically used by ethnomusicologists do not have time-code and so there is no reliable way to describe specific points in time and connect those to analytic comments with any certainty.

The annotation of materials is almost always done best by the scholars who made the recording and who understand the local culture that they documented. Scholars are certainly capable of making notes on their video recordings now, but no good models exist for a collaborative approach between the documentary scholar, catalogers, other scholars, and educators. This collaboration needs to create time-coded, detailed annotations using common search or subject terms in a language that will be useful to scholars and students, both present and future.

3) **Access.** Because these carriers are fragile and because most exist only in private collections, much of this video is never seen—even by the scholars who made the recordings—for fear of wearing out their tapes and copies. We need broader and easier access to these materials because they are important for comparative research and for pedagogical purposes. In other disciplines it is common for scholars and students to have access to the raw data or original source material so that they can examine the analytical process and judge the conclusions of the collector. While ethnographic documents such as field video are only artifacts of a broader cross-cultural encounter by the ethnographer, the discipline would be better served by a greater availability of these original materials or raw documents. Biologists may get access to another scholar's statistical calculations of cell division rates or a literary scholar will address a novel readily available to others, but the primary data of ethnomusicologists is remarkably closed to scrutiny by their colleagues and students, largely because of technological issues.

Institutional archives sometimes provide access to video materials if they have the resources to make viewing copies and maintain viewing stations. However, as we have indicated, much of this kind of video is not even being stored in such institutions. A program needs to be created that provides a framework as well as a system to help scholars deposit their video and make it accessible. This program would utilize digital video technology, refine annotation procedures, and clarify intellectual property issues related to broader Internet access. As these materials will be available via the advanced Internet2 network, scholars and students will be able to use them in new and exciting ways.

4) **Intellectual Property.** These video recordings contain a wide variety of intellectual property from highly transferable performances with no single owner of rights to well known works from the commercial realm with several copyright holders. The discipline of ethnomusicology and others like it need a model with a coherent strategy for making materials collected while conducting ethnographic research more accessible. Some of these strategies begin in the field when the documents are recorded and the ethnographer explains the potential uses of the recordings to those who appear in them. Ethnomusicologists have ethical standards that require written or verbal permission for making recordings and they require explicit descriptions of how the material will be used. Moreover, research with human subjects based at both IU and U-M is guided by the rules set forth by their respective Internal Review Boards or Committees on the Use of Human Subjects in Research. The use of the Internet as a distribution channel, however, raises issues that were not widely considered five or ten years ago. Even the limited scope of access we are proposing requires a coherent legal and ethical strategy. The strategy we develop may be a useful model for other analogous projects.

U.S. copyright law is an especially interpretable area of the law and it has frightened and thwarted the efforts of many who have attempted to use the Internet as a distribution channel. While issues of still image and sound distribution are being solved, few good models of intellectual property exist relating to ethnographic video materials. We have made significant progress during the planning phases toward outlining guidelines for claiming Fair Use. The debate needs to be broadened further with other experts in intellectual property, ethics, and ethnomusicology.

5) **Pedagogy.** Ethnomusicologists are at a great disadvantage when it comes to locating audio-visual materials for classroom use. Pedagogical materials available for the study of musics outside of the euro-American classical tradition are woefully inadequate.

Unlike many other scholars in the humanities, ethnomusicologists cannot solely rely upon canonical literary texts or musical scores as a source for analysis. Because we analyze cultural change and cultural relationships, we need access to both current and historical video recordings of situated musical performances and to the annotations added to those recordings by researchers. What ethnomusicologists and other ethnographic scholars and students need is access to a wide range of performances that facilitate trans- and intra-cultural comparison.

Despite the fact that video of musical performances has great educational appeal, most commercially-available resources of recorded events for teaching ethnomusicology show only brief moments of musical performances. The “JVC Anthology of World Music” is the best-known video resource of musical performances, but the examples contained in the anthology are still relatively short excerpts that do not allow a scholar or teacher to examine more than a few minutes of one kind of musical performance. Existing examples are typically edited in ways that do not leave room for analysis or further examination of entire musical events and explanatory materials are usually scant or non-existent.

**6) Technology.** The technological tools that enable ingestion, storage, indexing, access, serving, and re-purposing of large video archives have now developed to the point where they can support a project of the EVIA Digital Archives' scale. Ethnomusicologists have to date had little access to these technologies, and have therefore not had the opportunity to use them to expand the scope and linkage of their research and pedagogical efforts.

Video and digital asset management technologies, which provide for storage and retrieval of vast quantities of data, are not yet widely deployed on university campuses, and are generally not available within the humanities disciplines. Technologists, faculty members, and librarians have little experience in using these advanced systems to support research and pedagogy. The EVIA project represents a relatively controlled "end to end" application where these advanced video and digital asset management technologies can be deployed and evaluated. The lessons learned from using these technologies have the potential to greatly impact the use of rich media to support research and pedagogy in other disciplines, as well as provide valuable information that will help technologists deploy these technologies on a much larger scale than deployed today.

### **Project Description**

We propose a two-year development phase of the EVIA Digital Archive project in which we build upon the year-long planning phase funded by the Mellon Foundation. Indiana University and the University of Michigan will move from their successful collaboration during the planning phase to realize a working model for access and preservation of ethnographic data collections, for well-reasoned Fair Use policies, and for digital asset management solutions within university technology infrastructures.

1. The EVIA Digital Archive project will preserve rapidly deteriorating field video by making digital copies and by encouraging deposition of original materials into institutional archives through a fellowship program. The process will create both Digital Betacam preservation masters as well as digital file copies. The latter will be stored in a mirrored and secure robotic tape storage facility.
2. Members of participating institutions will have access to high-quality streaming versions of these materials through Internet2. Different quality versions will be streamed to serve a variety of purposes such as projection in a classroom or research at a computer workstation. Once material is ready for implementation near the end of the development phase, access will be allowed to anyone working from IU or U-M. Through an accepted set of IP addresses or domain names we will also allow access to a select group of educational institutions based on a) the affiliations of depositing scholars, b) network technology capabilities of those institutions, and c) the refinements of sustainability decisions made during the development phase.
3. The deposition process will be combined with a fellowship program for scholars so that they can generate detailed annotations and analysis of the video and work with catalogers to create metadata that will be readily categorized and searchable.
4. Internet access and the copyrightable or copyrighted nature of the materials demand a coherent intellectual property strategy. During the planning phase we

- developed a strong argument for utilizing Fair Use. Expanding our discussion to a wider group of experts during the development phase will refine this stance.
5. The EVIA Digital Archive will provide scholars with a large body of video for research and instructional use as well as create focused pedagogical units from the video.
  6. Development of digital asset management and video metadata technology systems will serve as a model for technologists and other humanities projects that depend on digital technology.
  7. The project will create administrative and sustainability plans for the EVIA Digital Archive beyond the development phase.

Indiana University and the University of Michigan will provide office and working space for the project, fee remissions for graduate assistantships, the use of some existing hardware, computer and video technology support, advanced networking support, teleconferencing support, technology hiring support, mass data storage, usability evaluations and a wealth of experience from digital library projects at both institutions. Our request for \$874,973 from the Mellon Foundation will be used for salaries, some equipment and software purchases, stipends for faculty participation, and travel funds to create a system for which no equivalent in the humanities exists. Indiana University and the University of Michigan will each provide approximately \$250,000 of in-kind contributions to the project for a total project cost of \$1,373,388. This request will fund a twenty-eight month development phase, at the end of which we expect to have the system developed, tested and operational. We will seek additional funding support for the next two-year growth phase that will accession 300 hours of moving images.

The EVIA Digital Archive will present the raw data of research, accompanied by detailed commentary and analysis by the documenting scholars, and ultimately, focused pedagogical programs using the field video. Thus, the project will reach a wide range of academic participants—ranging from first year students to senior scholars to a potentially a wider public audience. The annotations will add significant research value to these materials. Such materials for teaching and research are not currently available to the public or will be newly created through the project itself. We will be creating a new kind of academic publication, one that capitalizes upon the potential of digital media in ways that other scholarly digital projects are only beginning to fully exploit (Please see the usage scenarios in Appendix 1). Access to the archive will grow in stages. Utilizing the high bandwidth of Internet2's Abilene network, we will begin by providing access to the campuses of Indiana University and the University of Michigan. After the development phase and as the project grows to include other scholarly depositors from other CIC institutions, access will grow in kind.

We will begin by developing the technology systems for managing the archive's digital assets. Once that is established, we will invite a group of scholars from Indiana University and the University of Michigan to attend a two-week summer institute at Indiana University during the summer of 2004. During the institute, scholars who participated in the planning phase will be invited to deposit and annotate their digitized video collection. The annotations of the video are designed to increase the scholarly and

pedagogical value of the video material. These scholars will both provide a significant amount of annotated video to the archive as well as test and evaluate the system. The summer institute will provide a way for scholars to discuss issues relevant to the project and to share their evaluations of the annotation process itself.

During our planning phase we divided project participants into three expertise areas:

1. Research and Pedagogy
2. Intellectual Property
3. Technology

Although these three areas are necessarily interdependent, we will discuss the proposed development phase of this project with these same divisions. The planning phase required that these teams collaborate because each depended on guidelines produced by the other. Therefore, while we will describe the development phase plans of each area, the project personnel of one team will be working in concert with the other teams.

#### Research and Pedagogy

During the planning phase ethnomusicologists and librarians, along with technologists working in areas of pedagogy, worked out parameters for deposition, a fellowship program, annotation possibilities, interface mock-ups, and usage scenarios. In the development phase, this team will further develop short- and long-term focus areas of the project. Short-term areas include assisting with design and development of user interfaces and search functionality, annotation models, usability evaluations, and pedagogy section models. Long-term areas include guidelines for deposition, fellowship planning, and a governing board. Our proposal for a forum on the EVIA Digital Archive project was recently accepted for presentation at the Society for Ethnomusicology's annual meeting. We will use this forum to gain feedback from other ethnomusicologists on our plans to create the EVIA Digital Archive.

#### Intellectual Property

During the planning phase, intellectual property experts and a copyright lawyer hired by the project developed a well-reasoned Fair Use strategy for the EVIA Digital Archive (see Appendix II). We determined that we can operate the archive under the conditions of Fair Use for the following reasons:

1. The character of the use is educational or research related.
2. The nature of the work is fact-based.
3. The video we propose to use is not a commercial commodity and our use will have no impact on the potential market for these products because as scholarly field recordings there is no current market for them.
4. Access to the EVIA Digital Archive will be limited to educational institutions.

What remains to be accomplished during our development phase is a refinement of implementation, particularly in terms of how it will affect access and long-term growth of the archive. In conjunction with this approach, we must develop a methodology for

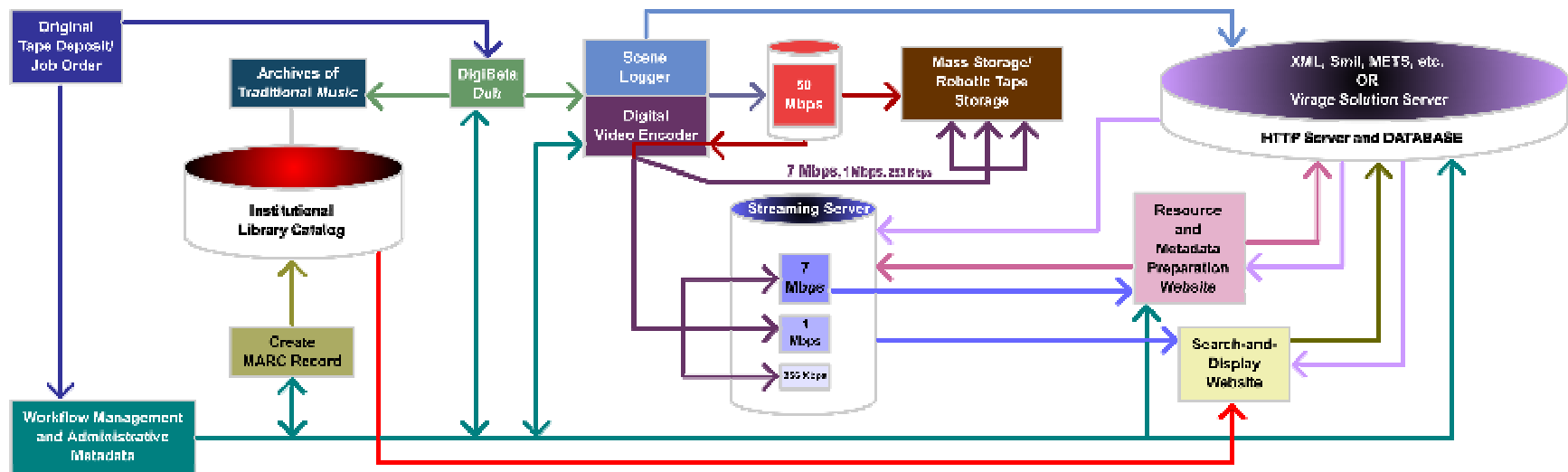
fieldwork so that permissions take into account deposition in an online archive/library. Also, as we refine our strategies for long-term support of the archive, these approaches affect the legal stance we can take. For example, if a fee is charged for access, this will impact our legal stance and responsibilities to subjects. Finally, the archive needs to develop a set of ethical guidelines for access, distribution, and deposition acceptance based on guidelines used by ethnomusicologists today. The development phase includes plans for a special forum on legal issues and ethics as it relates to the EVIA Digital Archive to be organized at the fall 2003 Society for Ethnomusicology conference. This forum will present the work of the archive in terms of intellectual property and ethical issues as it relates to ethnomusicological fieldwork and methods. It will also provide the project with valuable feedback from a range of scholars in the field of ethnomusicology.

### Technology

During the planning phase, the team of technologists, librarians, and archivists were charged with planning a digital archive and library system that was scalable, stable over the long term, and capable of delivering high-quality video over Internet2. Systems were investigated and plans were made, but an implementation will require a two-year development phase. Technology development will require the largest investment of personnel and resources. Here development will occur in the areas of database building and linking, metadata schemes, advanced networking, video streaming, access, digital video encoding/transcoding, usability, and digital asset management.

Figure 1

### Digital Asset Management Procedures



## Digital Asset Management Procedures

The EVIA Digital Archive Project proposes to build a scalable digital asset management environment that we will be able to integrate with digital asset management systems initiatives taking place at both Indiana University and the University of Michigan. Although all technology development will be directly related to the requirements of the EVIA Digital Archive, methods and processes developed in the course of the project will have relevance and will be extensible to projects with similar requirements within our universities. While commercial systems exist, and the project may partake of some components these pre-built systems offer, significant extension and/or development will still be required to insure compatibility with campus infrastructures. A description of the system we started to design during our planning phase is described in narrative form. Please see the accompanying diagram in Figure 1 or on our website<sup>1</sup> at <http://www.indiana.edu/~eviada/protecteditems/amp/index.htm>

Described here is an idealized implementation of the ingestion and preparation steps of the archive. This is the model we plan to implement during the development phase. For a discussion of how we have planned the full implementation of the archive, see Appendix III.

### Collecting Initial Metadata

Viewing the procedure in a chronological perspective, we begin with a deposit of the original tapes by the scholar who recorded them. Prior to this point, the depositor would have sent a descriptive list of tapes to the project manager and a cataloger would have determined a naming and numbering scheme. Once the tapes have been received, a job order will be generated using a web form that is dynamically linked to our http server and database. This begins the collection of administrative metadata that will follow the ingestion, resource creation, and publication process to the end. Thus, project staff can determine from the database at any time the status of the physical and digital assets.

### Encoding and Preservation Copying

The original tapes will be given to a video engineer who will examine the tapes, determine if any special preservation issues exist, set optimal signal levels, and make a transfer of the original tapes to a digital tape format with time-code. Significant information about these settings will be entered in the database. Currently, our digital tape format of choice is Digital Betacam. Its advantages include its affordability for a high-end format, its relative stability, its relatively wide distribution of use, its excellent audio capabilities, and the ability to create a copy with an elapsed time-code reference.<sup>2</sup> Its disadvantages include its mild image compression.

Archivists on our team made persuasive arguments for making a Digibeta preservation master as well as creating a digital video file. The reasons are as follows:

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<sup>1</sup> Access to protected parts of our website can be gained with the username: guest and the password: guest. This particular web document requires the free Macromedia Flash Player, available for download at <http://macromedia.com/downloads/>

<sup>2</sup> We are presuming that most tape deposits will be in formats that do not have time-code.

1. Good archival strategies depend on redundancy and diversity of formats. This is especially important when working with digital formats where there is frequent turnover in codecs and hardware. And unlike the analog realm, when digital signals degrade, the loss is total, not partial.
2. Good archival strategies depend on making the best possible copy at the time of deposition. Digibeta offers an affordable best copy strategy for video and is presently endorsed as a standard by the Library of Congress.
3. Digibeta allows us to make copies with uncompressed audio—a feature none of the digital video file formats allow. For the digital files we will be using MPEG-2 which has an audio compression ratio of 12:1. While the audio quality in MPEG-2 is excellent, there are archival concerns with making preservation copies that rely on any kind of compressed audio. A Digibeta preservation master brings the project in line with current archival practices for video as well as audio.
4. The long-term storage and retrieval of digital video files is new territory, and an archival strategy would argue for hedging when dealing with new storage technologies.
5. In the event that new encodings would ever need to be made, a tape copy would exist with time-code. While we feel confident about the accessibility of MPEG-2 over time, improved compression and storage schemes will undoubtedly be created and having a Digibeta master would give us more options in the future.

Digital video is an area in which no ready solutions or models exist. We believe that our strategy of creating a Digibeta tape as well as a high-quality digital file satisfies the concerns of both an archive and a digital library. The Digibeta preservation master will provide us with a copy for physical archiving that has time-code for subsequent encodings if they are ever necessary. A high quality, MPEG-2, I-frame only, 50 Mbps digital video file satisfies the need to have a high-quality digital file from which to generate streaming access files many years into the future. A hardware video encoder will convert the Digibeta preservation master into a series of high-quality digital files at several different compression levels to provide access for different purposes.

We intend for deposition arrangements to include some institutional arrangement for the original tape. Once the Digibeta preservation master is made, the original tape can be returned to the depositor, but it is our plan to work out arrangements for either the Archives of Traditional Music or some other institution archive to accession the originals. The Digibeta preservation master will be deposited in the Archives of Traditional Music at Indiana University.

#### Cataloging for Library Databases

From the very beginning of the process, a cataloger will work with the depositor to identify the best way to describe the content of the video for cataloging purposes. They will also establish the naming/numbering procedure for each collection deposited. The MARC records that will be generated will become part of the Indiana University and University of Michigan library catalogs and will be contributed to the OCLC union

catalog. Catalog records will need to be created for the Digibeta copy, perhaps for the original copy, and for the digital file that will exist in the EVIA Digital Archive.

### Storing the Digital File

Archivists do not like to work with compressed digital materials because they want to create the best possible copy. The high data rates of digital video require, however, that we work with video that has been compressed to some degree. Uncompressed video is transferred to a digital file at approximately 250 megabits per second, but this is currently an extravagant file size and not economically feasible. We have found that a file format of 50 Mbps I-frame only MPEG-2 is a good compromise for answering both archival and economic points of view. A purely archival point of view would argue for uncompressed digital video at 270 Mbps. At this rate, very expensive hardware is involved and an hour of video requires 146 Gigabytes of storage space. A purely economical point of view would argue for the lowest possible encoding rate at which moving images can be stored. However, compression artifacts are easily visible at low rates such as 7Mbps and can even be seen at 25 Mbps (DV quality). Storing files at 50 Mbps I-frame only MPEG-2 provides a high-quality video stream, and while this rate requires a significant amount of storage space (27 GB per hour of video), it is within reason economically.<sup>3</sup> I-frame only MPEG-2 is essential for archival reasons and for certain research purposes because it captures each individual frame of video. We need to preserve the individual frame information for the following reasons:

1. Some ethnomusicological research depends upon frame-by-frame analysis.
2. Video editing depends on having no interframe compression. While video production is not an aspect of our project, an archive perspective requires we consider all possible future uses. One important future use may be the use of the video by the depositor or an outside agency for a video documentary of some kind.<sup>4</sup>
3. The ability to produce the best quality of compressed files for streaming is dependent upon starting with high-quality files.

The first digital copies will be temporarily housed at the Media Union at U-M during processing, and will then be moved to Indiana University's massive data storage system (MDSS). This copy will be our digital preservation file. Stored in a robotic tape access facility and mirrored at a site at IUPUI in Indianapolis, this solution offers a very reliable long-term storage solution for digital files.

### Variable Quality Streaming

The 50 Mbps copy is currently too large to deliver to end-users over Internet2 and so we will generate 3 more copies for access purposes. An MPEG-2 copy at DVD quality

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<sup>3</sup> The economics of data storage are such that the cost will continue to drop and three years from now our concern about four terabytes of storage will seem insubstantial.

<sup>4</sup> Our IP strategies suggest that the EVIA Digital Archive would not take on the task of licensing the use of the video, but rather the depositing scholar would work out those arrangements with outside agencies.

(approximately 7 Mbps) will be created so that users will have a high quality copy for viewing and for projecting on large screens in a classroom. A 1 Mbps MPEG-1 version will be created for general workstation use, and a 300Kbps will be created for use on low quality networks and for thumbnail versions of the video. These files will be generated on the fly using Telestream's FlipFactory, which will allow us to better serve end-user configurations as well as reduce the amount of storage space required.

The high bandwidth capabilities of Internet2 will allow the three lower rate versions to be streamed with few problems.<sup>5</sup>

- Preservation copy—50 Mbps I-frame only MPEG-2
- Classroom projection or research—7 Mbps MPEG-2
- Workstation use—1 Mbps MPEG-1
- Low bandwidth use—300 Kbps Real, QuickTime, or Windows Media

The playback of MPEG-2 will be accomplished by serving it with IBM's VideoCharger, which is currently in use at IU. Alternatively, the developments in QuickTime will allow for MPEG-2 playback without special hardware at the workstation.

While 7Mbps can be compared in bit rate to DVD, the comparison is misleading. The danger is that we compare the video compression quality we see on Hollywood DVD titles (often as low as 4Mbps) with what we will be able to produce with the hardware available to us. The hardware used for such compression work is only affordable on a Hollywood budget. Simply put, the quality at 7Mbps that is possible with a good MPEG-2 hardware transcoder/encoder (such as what we will use for this project) is not suitable for creating files that will be used as a digital preservation master for a number of reasons:

- 1) Too many compression artifacts are visible, especially if the camera is handheld or panning. This phenomenon, which our technologists anticipate, presents great challenges to any video compression job. These compression artifacts can obscure important features for research such as playing techniques, non-verbal communication among participants, and important visual ornamentations of clothing and instruments.
- 2) We must store a digital file with I-frame only compression for three reasons:
  - a. Thinking both long and short term, we must store a digital version that will facilitate video editing. Any compression scheme that uses interframe compression seriously compromises that possibility. Thus, we must save a file with every frame preserved. A bit rate of 25Mbps is used for DV formats (MiniDV, DVCAM, etc.), but DV relies on interframe compression. Because we must maintain frames and preserve an image with good quality, 50Mbps is the best choice as it provides a superior image quality over other viable options. This difference was noticeable in a side-by-side comparison conducted at

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<sup>5</sup> This assumes that the facility will have Internet2 level cables and hardware that connects from the workstation to the network. A slower hub or cable in the walls of a classroom can foil optimal performance. Fortunately, classrooms on many campuses are being upgraded to handle this heavy traffic.

the second planning workshop where 1, 7, 25 and 50 Mbps compression were evaluated.

- b. Ethnomusicologists interested in studying the relationships between music and movement or the intricacies of playing techniques occasionally use frame-by-frame analysis. In some musics, visual information is extremely important to understanding who plays which part. Video with interframe compression compromises the validity of such an analysis. Thus preserving each frame is necessary and again, 50Mbps produces noticeable quality differences when dealing with I-frame only compression.
  - c. We can count on an improvement in compression schemes and a change in file codecs over time. By storing a digital file with every frame preserved, we will be better able to generate new files that conform to expectations of quality and format. If we rely on a low quality version with compression between frames (e.g. 7Mbps MPEG-2), we seriously compromise compatibility with those expectations.
- 3) We are dealing with video produced outside of a studio, typically in circumstances with a great deal of important background content. Such a scenario presents great challenges to effective video compression. Low compression levels with such footage result in very noticeable compression artifacts. Not only are these artifacts distracting, but they also permanently obscure the data that scholars will use for cultural analysis.
  - 4) Ethnomusicologists not only study musicians but they also study the interaction of musicians with other participants and audience members. Costume and gestural details can be highly significant. Background imagery and small details of the video image are important to successful research, and highly compressed formats such as 7 Mbps produce video with diminished background detail.

### Segmenting the Video Files

At the same time that the video is encoded, we intend to apply a scene-logging program to the video. This scene-logging program will mark sections the video according to scene changes and serve as a starting place for annotation by the depositor.<sup>6</sup> Several commercial products already exist for scene logging, but given the rapid change in this area and the not-yet-determined metadata and database structures, we will defer our choice of software to the development phase.<sup>7</sup> Through the University of Michigan we will have access to the scene logging capabilities of software made by Virage. We have not yet had the opportunity to test this capability and its usefulness to our project, but we intend to do so during the development phase.

Once streaming quality versions of the assets are available, the depositor will be able to begin the work of annotating the video. The depositor will be able to view the video and

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<sup>6</sup> Scene logging software locates abrupt changes in the video image and creates a frame reference for that break. It will show when the camera has been paused or turned off and turned on again.

<sup>7</sup> Other automatic metadata generating programs exist—speech to text, facial recognition, and Optical character recognition—but these will not be well suited to most of the video that we will encounter.

enter scene annotations at exact time-coded points or regions. Using the Resource and Metadata Preparation web page that is linked to our database, the depositor will enter explanatory information about the entire video and about individual scenes. Such annotation will include scene and action descriptions, organization of scenes into chapters, including transcriptions or translations, and creation of higher-level analytical and organizational categories. During this process, the depositor will work with a cataloger to ensure consistency in the use of descriptions, subject categories, and keywords. Both will inform each other's work so that the material is optimally accessible. The result will be a more detailed MARC record that will be searchable through the universities' online library catalog as well as structural metadata to assist users in navigation of video in the EVIA Digital Archive system's user interface. This descriptive information can then be displayed when a user views the video.

At the core of our system is an http server and relational database. This database will store all of the descriptive and administrative metadata about the video and other digital assets. For the purposes of this project, we are currently working with some of the most recent technology provided by, but not limited to, corporations such as Sun Microsystems, IBM, and Virage Technologies. Given the fast pace of technological advancements in this field and the need for more research and development related to our current and future needs, we will continue to explore ways to match project needs with cutting-edge technology as well as solutions created by our development team. In any case, the database environment will need to be tailored to our own metadata schema and workflow processes. In keeping with our desire to make this project a scalable model, we intend to use existing standards and widely accepted approaches. For example, we intend to strongly consider the METS (Metadata Encoding and Transmission Scheme) XML schema <http://www.loc.gov/standards/mets/> as a means of encoding and storing structural, administrative, and descriptive metadata for archival storage and interactive use. Again, depositors and EVIA Digital Archive staff will be able to enter data about the digital assets from a web-based form.

Once the resources are completely prepared and approved, end-users can search, browse, and view the archival materials from any web-accessible workstation within institutions having access to the archive. End-users can view the video in a number of ways: as a full screen projection, or as a display that shows the video and dynamic links to the depositors' annotation. A search feature will also be an important part of the site. As the project develops and expands, access will be increased as well, beginning with CIC universities and then eventually expanding beyond them.

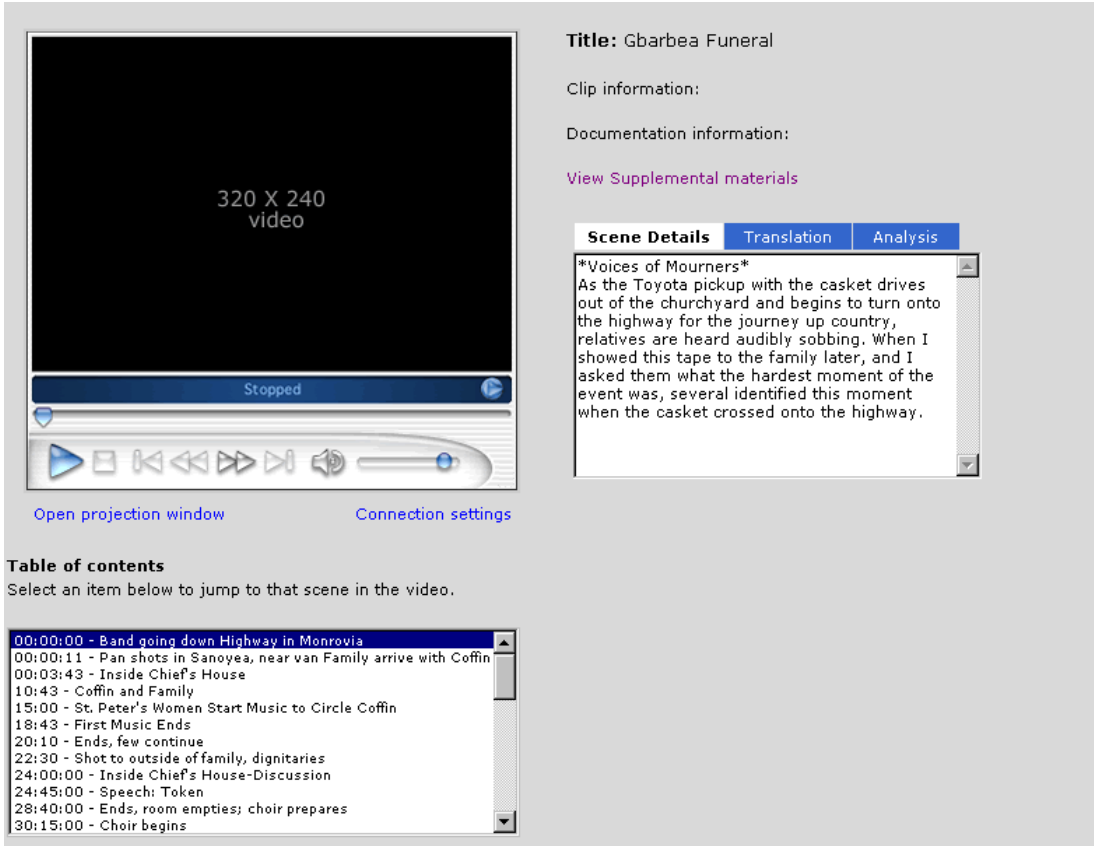
### Metadata

The annotation by the scholars will constitute one aspect of metadata in this project. This metadata will include (1) identification of scenes that is coordinated with the time-code (see Figure 3, lower left window); (2) annotation of scene details of an hour of video consisting of between 150-500 words or 1-5 screens (See Figure 3, right window); (3) supplemental materials such as photographs, audio files or some other material that help document the videotape, and (4) themes or subject terms that are appropriate for classifying the performance on the videotape (see figures 2 and 3). The subject terms will

be developed as the project proceeds through consultation among the scholars with some latitude for expansion as the material warrants.

Another aspect of metadata that will be developed for each tape will be library cataloging that uses the MARC format, employing practices that have been developed for sound recording at the Archives of Traditional Music and have helped shape national and international standards.

**An example of what an end-user's screen might look like:**



**Figure 2**



**Figure 3**

## Production Costs

### Commercial Costs

Estimated costs for having our video dubbed and encoded by an outside commercial vender can be seen below. These estimates are from Vidipax which is an agency that specializes in the kind of video transfers we will be dealing with. In addition to handling the dubbing they also do restoration work on older tape formats. We have made some estimates based on our expectations that a third of the video may need some restoration work (primarily to address “sticky shed” problems), while the rest will be a straight transfer. Vidipax’s dubbing costs are lower than if we did the work ourselves, but we can do the encoding for considerably less and with less trouble. File transfer between EVIADA and Vidipax will require storing the files on specially constructed hard drives and then shipping them back and forth. When the encoding is performed at the University of Michigan, file transfer will take place over Internet2. While the dubbing and encoding processes could be separated, it makes considerably more sense to do them together in one pass and to maintain consistency in the way they are performed.

#### Commerical Dubbing and Encoding Costs

	Total cost	Per hour cost
<b>Dubbing to Digibeta</b>		
30 min 1/2" open reel with restoration (\$300 per half-hour x 2 hours)	\$600.00	\$600.00
60 min 1/2" open reel with restoration (\$480 per hour x 4 hours)	\$1,920.00	\$480.00
60 min cassette with restoration (\$358 per hour x 50 hours)	\$17,900.00	\$358.00
60 min cassette with no restoration (\$175 per hour x 94 hours)	\$16,450.00	\$175.00
Blank tape stock costs	\$5,475.00	\$36.50
<b>Total Dubbing Costs</b>	<b>\$42,345.00</b>	<b>\$282.30</b>
<b>Encoding</b>		
Encoding at 50 Mbps (\$25 per minute x 9000 minutes)	\$225,000.00	\$1,500.00
5 Hard drives needed for transfer	\$5,000.00	\$33.33
Hard drive shipping costs	\$2,500.00	\$16.67
<b>Total Encoding Costs</b>	<b>\$232,500.00</b>	<b>\$1,550.00</b>
<b>Total Dubbing and Encoding Costs</b>	<b>\$274,845.00</b>	<b>\$1,832.30</b>

## Cost Analysis

The following cost analysis was performed to answer long term sustainability questions of the project. Thus, we have used only those administrative costs that would be entailed after the development phase. That is, much of the administrative costs in this proposal are for the development of the project and these costs would disappear once development was complete. By the same token, office and lab space costs were estimated based on the long-term needs of the project past the proposed development phase. Equipment was expensed based on its expected life. For example, the Digibeta record deck can be expected to last ten years; while the encoding workstations, only three.

We have included the salary and fringe benefit costs for administrative and technical personnel directly connected to dubbing and encoding. However, we did not include GA fee remissions in costs associated with dubbing and encoding because this is not a real cost to the university. It is also part of the academic enterprise and an expense that would not exist if we performed this work in the most economical manner. The Vela Argus encoder that we will use for encoding the video was not included because it is a piece of equipment that the University of Michigan already owns as part of other infrastructure support. We can expect that this kind of equipment will be available to this project in the future.

Yearly Production Costs			Total for 75 hours of video (1 year)	EVIADA Cost per hour of video	Commercial Cost per hour
	Mellon	In-kind			
<b>Dubbing</b>					
Supervisor (Dubbing and Encoding)	\$5,000.00				
Supervisor Fringe Benefits	\$1,350.00				
Graduate Assistant	\$7,000.00				
GA Fringe Benefits		\$4,800.00			
GA Fee Remission (\$12,718)		\$0.00			
UROP assistants		\$12,500.00			
Digibeta Record Deck expensed over 10 years	\$2,800.00				
Estimated Digibeta deck maintenance costs per		\$250.00			
Digibeta blank tape costs	\$2,737.50				
Video Preservationist Consulting (\$7500) expensed over 5 years	\$1,500.00				
<b>Dubbing Subtotal</b>	<b>\$20,387.50</b>	<b>\$17,550.00</b>	<b>\$37,937.50</b>	<b>\$505.83</b>	<b>\$282.30</b>
<b>Encoding</b>					
Supervisor (Dubbing and Encoding)	\$5,000.00				
Supervisor Fringe Benefits	\$1,350.00				
Graduate Assistant	\$7,000.00				
GA Fringe Benefits		\$4,800.00			
GA Fee Remission (\$12,718)		\$0.00			
Vela Argus Encoder expensed over 3 years		\$0.00			
1 Terabyte Scratch disc space at UM (\$18,000) expensed over 3 years	\$6,000.00	\$3,500.00			
<b>Encoding Subtotal</b>	<b>\$19,350.00</b>	<b>\$8,300.00</b>	<b>\$27,650.00</b>	<b>\$368.67</b>	<b>\$1,550.00</b>
<b>Dubbing and Encoding Totals</b>	<b>\$39,737.50</b>	<b>\$25,850.00</b>	<b>\$65,587.50</b>	<b>\$874.50</b>	<b>\$1,832.30</b>

<b>Yearly Production Costs</b>					
			<b>Total for 75 hours of video (1 year)</b>	<b>EVIADA Cost per hour of video</b>	<b>Commercial Cost per hour</b>
	<b>Mellon</b>	<b>In-kind</b>			
<b>Digital Storage</b>					
MDSS 4 Terabytes data storage (\$25,000) expensed over 10 years		\$2,500.00			
<b>Digital Storage Subtotal</b>	\$0.00	\$2,500.00	<b>\$2,500.00</b>	<b>\$33.33</b>	
<b>Streaming</b>					
Streaming server (\$30,000) expensed over 3 over 2 years	\$10,000.00	\$5,000.00			
Transcoding workstation (\$27,000) expensed over 3 years		\$9,000.00			
<b>Streaming Subtotal</b>	\$10,000.00	\$14,000.00	<b>\$24,000.00</b>	<b>\$320.00</b>	
<b>Non-Development Project Administration</b>					
Executive Investigator	\$10,365.00				
Executive Investigator Fringe Benefits	\$3,182.00				
<b>Administrative Subtotal</b>	\$13,547.00	\$0.00	<b>\$13,547.00</b>	<b>\$180.63</b>	
<b>Space Requirements</b>					
UM Encoding Lab		\$2,000.00			
UM set up costs	\$800.00				
1 Administrative office	\$864.00				
<b>Space Requirements Subtotal</b>	\$1,664.00	\$2,000.00	<b>\$3,664.00</b>	<b>\$48.85</b>	
<b>Workstations expensed over 3 years</b>					
UM Encoding lab	\$1,333.33				
SAVAIL	\$7,893.33				
<b>Workstations Subtotal</b>	\$9,226.67	\$0.00	<b>\$9,226.67</b>	<b>\$123.02</b>	
<b>Annotation</b>					
Summer Institute 2004 travel, lodging, and	\$11,640.00				
Summer Institute Fellows Stipend. 8	\$24,000.00				
Hourly Cataloguer	\$6,000.00				
<b>Annotation Subtotal</b>	\$41,640.00	\$0.00	<b>\$41,640.00</b>	<b>\$277.60</b>	
<b>Totals</b>	\$115,815.17	\$44,350.00	<b>\$160,165.17</b>	<b>\$2,135.54</b>	

### Institutional Support Units

Those of us who worked as a small coordinating group during the planning phase always believed in the importance of the project we were creating, but we confess to being surprised by the intensity of the support it has garnered from many units of our respective institutions. These units have seen that the EVIA Digital Archive project promises to be a model to several different constituencies. Ethnomusicologists and other humanities scholars are interested in the research, pedagogical and intellectual property issues; technologists are excited by the chance to implement the latest developments in streaming video technology and to create a model for larger scale digital asset management systems; intellectual property specialists are intrigued by the challenges our cases present but also eager to use it as a way to develop a well-reasoned stand on Fair Use; and archivists are very interested in addressing the vexing problems of preserving and increasing access to video.

The University of Michigan and Indiana University are well-positioned to lead and integrate this effort. Both are charter members of Internet2, which provides the advanced networking that will deliver high-quality digital video to classrooms, conference rooms, and desktop computers around the world. We will also integrate this project into strategic initiatives for mass data storage at both universities. The Media Union of the University of Michigan will provide special equipment for encoding the video content.<sup>8</sup> In the long term, the project will be sustained by the Archives of Traditional Music, SAVAIL and the Digital Library Program at Indiana University, and by units within the Media Union at the University of Michigan.

Several previous projects have uniquely positioned the University of Michigan and Indiana University for leadership of this project. Indiana University's Archives of Traditional Music, supported by grants from The National Science Foundation and the National Endowment for the Humanities in the 1980s, was an early leader in the preservation and cataloging of ethnographic sound recordings. Several staff members of this project participated in the creation of interactive CD-ROMs in the 1990s, funded by grants from the National Endowment for the Humanities, which have incorporated ethnomusicological video for teaching (Stone 2000; Reed and Gibson 2002).

The Archives of Traditional Music (ATM) <http://www.indiana.edu/~libarchm/> is the largest university-based ethnographic sound and video archive in the United States. Its holdings cover a wide range of cultural and geographical areas, and include commercial and field recordings of vocal and instrumental music, folktales, interviews, and oral history, as well as videotapes, photographs, and manuscripts. The Archives of Traditional Music fosters the educational and cultural role of Indiana University through the preservation and dissemination of the world's music and oral traditions. The Archives seeks to fulfill its mission by developing appropriate acquisitions of audio and video recordings of the music and oral traditions from the diverse cultures of the world, and by cataloging and preserving the collections for use by educators, researchers, and interested members of the public, including the people from whom the material was collected. Staff

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<sup>8</sup> We may also rely on automatic scene logging software that is available at the U-M Media Union, but we are not convinced of its usefulness to our project at present.

at the archives will provide consulting support on issues of cataloging, preservation and technology. In addition, ATM's Director of Digital Initiatives, Alan Burdette, will serve as project manager and provide long-term administrative support for the EVIA Digital Archive.

The Indiana University Digital Library Program (IU DLP) <http://www.dlib.indiana.edu/> is dedicated to the selection, production, and maintenance of a wide range of high-quality networked resources for scholars and students at Indiana University and elsewhere. The DLP is a collaborative effort of the Indiana University Libraries, the Office of the Vice President for Information Technology (OVPIT), the School of Library and Information Science, and the School of Informatics. The IU DLP's current facilities include the Digital Media and Image Center (containing equipment for image, audio, and video capture), the Library Electronic Text Resource Service (LETRS), and an extensive server infrastructure for support of digital projects, with life-cycle replacement funding for hardware and software. IU DLP staff provides expertise in planning, creating and maintaining digital projects. IU DLP's Variations2 digital music library project <http://variations2.indiana.edu/> has received a \$3 million grant from the National Science Foundation to create an integrated digital library that presents users with access to sound recordings, musical scores, and video in a variety of formats. The Archives of Traditional Music has previously collaborated with the DLP in the creation of a digital library of Hoagy Carmichael materials <http://www.dlib.indiana.edu/collections/hoagy/>. Jon Dunn, the assistant director for technology for the Digital Library Program, will serve as one of the technical investigators for the EVIA Digital Archive Project. The School of Library and Information Science (SLIS) will provide consulting and support for library and metadata questions.

The Massive Data Storage Service (MDSS) is a distributed storage service offered by Indiana University's Information Technology Services (UITs) based on a consortium-developed software product called the High Performance Storage System (HPSS). This system consists of nearly 175 terabytes of disk and automated tape storage located in machine rooms at both the IU Bloomington and Indianapolis campuses, and was funded as part of the IU's Information Technology Strategic Plan to support the storage requirements of both administrative and academic systems and users, including digital libraries. The Indiana University Digital Media Network Services (DMNS) unit, <http://www.indiana.edu/~video>, provides institution-wide development and support for media streaming, videoconferencing and data collaboration services. DMNS is a unit within the University Information Technology Services organization. DMNS manager, Doug Pearson, will participate in the EVIA Digital Archive project as a technical investigator and will make unit resources available for technical guidance. DMNS will provide media streaming server infrastructure; will incorporate EVIA Digital Archive-provided media storage into the institutional digital media infrastructure and management model; and will provide guidance for development of EVIA Digital Archive systems according to institutional supported practices.

SAVAIL (Sound And Video Analysis and Instruction Lab) is a media lab within the department of Folklore and Ethnomusicology at Indiana University with the mission of

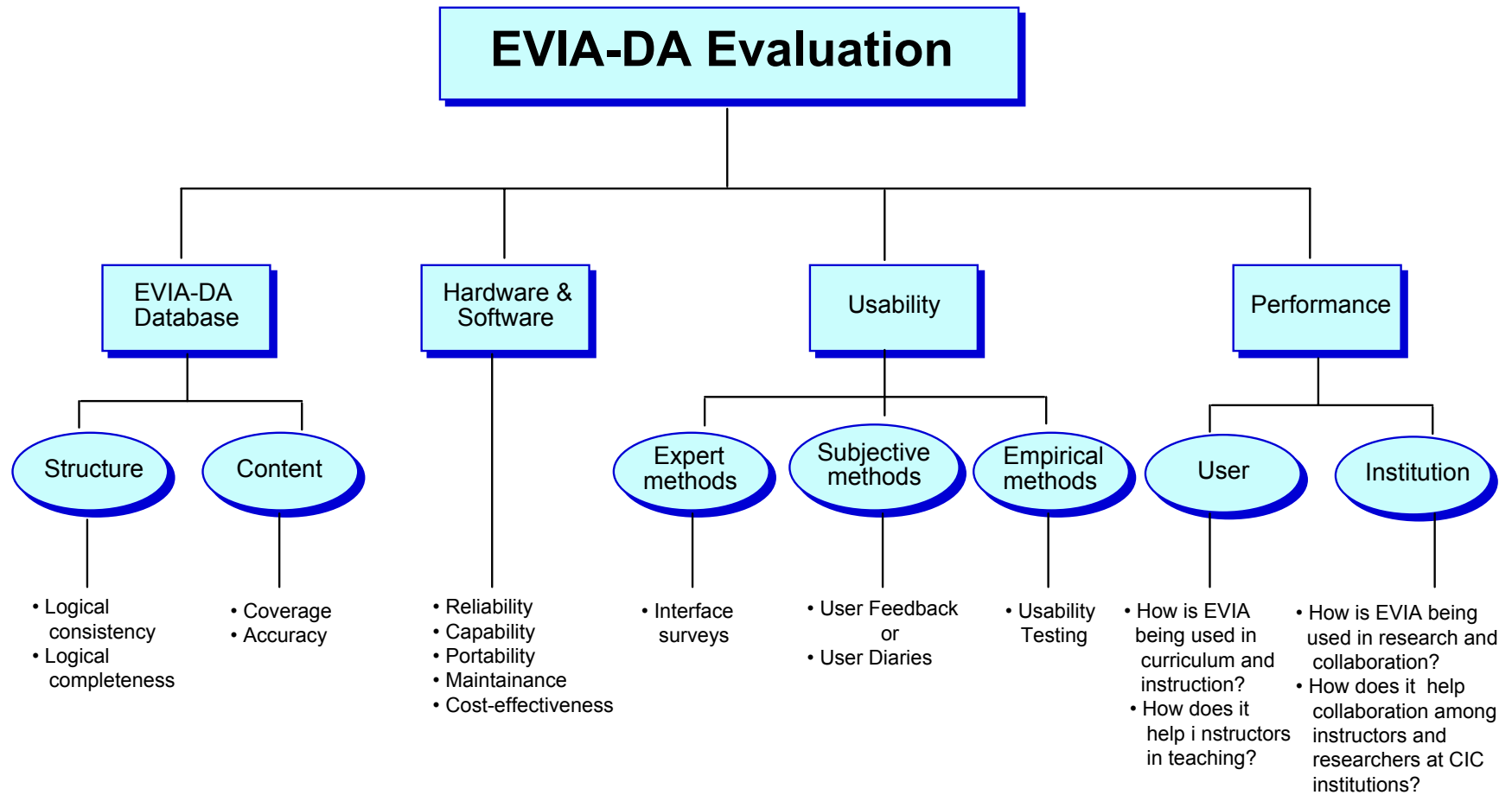
providing faculty and students with a facility for analyzing and disseminating sound and images as part of their ethnographic work [www.indiana.edu/~folklore/savail.savail.html](http://www.indiana.edu/~folklore/savail.savail.html). With some expansion, SAVAIL will provide a resource for the development team and for visiting fellows. A graduate assistant is already assigned there and will provide assistance to fellows and scholars who deposit materials later.

The University of Michigan has enormous capacity in the area of information technology, especially in the areas of instructional technology, advanced networking, and facilities support. Technology initiatives at Michigan are bolstered by a recent report and recommendations from the President's Information Revolution Commission, with many of the recommendations supporting the goals of the EVIA Digital Archive project. The University of Michigan's greatest contribution to the project lies in the resources and capabilities of the Media Union. This facility brings together information resources, information technology, production studios, and the combined talents of information professionals from across campus units to support projects like the EVIA Digital Archive. The Media Union is a campus-wide resource with a mission to facilitate interdisciplinary collaboration, integrative learning and exploration—virtues that are shared with the field of ethnomusicology. The Center for World Performance Studies will be another contributor to this project. Inaugurated in 1999, the Center's approach to changing technologies have altered the ways in which scholars and performers present themselves to audiences—through conferences presentations, publications, live performances, film and video, and audio recordings—rapidly changing issues that will significantly impact the future of the digital archive. The Center's faculty associates will play a key role in the sustainability of the University of Michigan's participation in this project.

#### Working Jointly

Working jointly will generate several benefits to this project that could not be realized by working alone. First, working jointly will necessitate that the project's systems will be integrated within the differing information technology infrastructures of two large universities. This will improve the chances of the project working within other university systems as the project grows. Secondly, the IT teams at both institutions will learn from each other as they try to solve the encoding, networking, storage, and delivery challenges together and the project can only benefit from this shared knowledge. Finally, working jointly requires us to think beyond our own institutions in issues of technology, pedagogy, and intellectual property. Such an approach may have some inefficiencies in the short run, but in the long run will make the project healthier as it broadens its holdings and access to them.

**Project Evaluation Procedures**



Specialist Type/Skill Set to Evaluate User Interface Component									
Database		Interface Software			Usability			Performance	
Structure	Content	Graphic Design	Interface Code Design	Database Linkage Design	Expert	Subjective	Empirical	User	Institution
Database Specialists	Librarians / Archivists	Graphic Designer	Interface Programmer	Database Specialists	Instructional Design Specialist	Instructional Design Specialist	Instructional Design Specialist	Instructional Design Specialist	Instructional Design Specialist
John Dunn	Chris B.	Dennis Hill	James McGookey	John Dunn, Doug Pearson	Erping Zhu, Matt Stoeffler, SLIS Usability Lab			Erping Zhu	Erping Zhu.

To ensure the quality of EVIA, evaluation will be carried out throughout the development and pilot-testing stages. The evaluation will address the four major areas of the system: 1) EVIA database, 2) Interface Software, 3) Usability, and 4) Performance.

The EVIA database evaluation will focus on the database structure, its logical consistency and completeness. It will also examine the database content, its coverage and accuracy. The evaluation will also ensure that the database meets library and archival data standards so that the data is retrievable and convertible.

The Interface Software evaluation will examine the reliability, capability, portability, maintenance, cost-effectiveness, and other issues of hardware and software. The SLIS Human computer Interaction Usability Lab at IU will provide their services to test the interface systems with real users. [http://www.slis.indiana.edu/technology/usability\\_lab.html](http://www.slis.indiana.edu/technology/usability_lab.html)

Three models of usability evaluation will be employed: expert methods, subjective methods, and empirical methods. Each model will be used when it is appropriate in the development phase, with expert methods first, subjective methods next, and empirical methods last. Interface surveys will be used to collect data for expert methods, user feedback or user diaries will be the data source for subjective methods, and finally usability testing will be used to gather data for empirical methods.

The performance evaluation will examine the EVIA database performance from the perspective of the user and the institution. Questions include “How is EVIA being used in curriculum and instruction?” “How does it help instructors in their teaching?” “How is

EVIA being used in research and collaboration?” and “How does it help collaboration among instructors and researchers at CIC institutions?”

References:

Adelman L. & Riedel, S. (1997). Handbook for evaluating knowledge-based systems: Conceptual framework and compendium of methods. Norwell, MA: Kluwer.

## **Project Timeline**

### 1<sup>st</sup> Quarter (9/02-12/02)

Hiring of development team personnel  
Office setup and purchasing  
Equipment purchasing  
Research and Pedagogy refinement  
Technology standards refinement  
Metadata standards discussions  
Workflow management procedures set up  
Basic database created for workflow management

### 2<sup>nd</sup> Quarter (1/03-3/03)

New Technology personnel begin  
Technology tools identified  
Development process determined  
System design begins  
Metadata standards refinement  
Research and Pedagogy refinement  
Development team meeting held in Bloomington  
Scenario-based usability analysis begins

### 3<sup>rd</sup> Quarter (4/03-6/03)

Board guidelines proposed  
System design work continues  
Metadata standards refinement continues  
Research and Pedagogy planning continues  
Scenario-based usability analysis continues

### 4<sup>th</sup> Quarter (7/03-9/03)

System design complete  
Annotation models developed  
Research and Pedagogy planning continues  
Development Team meeting held in Ann Arbor

### 5<sup>th</sup> Quarter (10/03-12/03)

Technology tool implementation/extension programming begins  
Video ingestion begins  
Board created  
Focused pedagogical unit models developed  
Legal/Ethical Forum at SEM conference

### 6<sup>th</sup> Quarter (1/04-3/04)

Implementation/programming continues  
Video Ingestion continues  
Further grant support process begun

Usability Testing Round 1  
Development team meeting held in Bloomington

7<sup>th</sup> Quarter (4/04-6/04)

Implementation/programming continues  
Testing begins  
Video Ingestion continues  
Preliminary annotation begins  
System and usability refinements made  
Further grant support process continues

8<sup>th</sup> Quarter (7/04-9/04)

Summer institute  
    Video annotation by ethnomusicologists  
    Evaluation of experience  
Evaluations made  
Further refinements made  
Further grant support process continues  
Solicitation of depositor/fellows for 2005  
Usability Testing Round 2  
Development team meeting held in Ann Arbor  
Access opened to full IU and U-M users

9<sup>th</sup> Quarter (10/04-12/04)

Refinements continue based on evaluations  
Access expanded to selected educational institutions  
Publicity of project and Archive  
Presentation at SEM conference

**Expected Outcomes and Benefits of the Project**

The EVIA Digital Archive will address a significant and timely need among ethnomusicologists and other ethnographic scholars using video for documentation purposes. The new organization that we propose to create grows out of the needs and demands of use of the video medium within ethnographic research. Because of its short archival life and the noticeable degradation that occurs in dubbing, video has presented scholars and archivists with serious challenges. Both old and new video formats have a poor archival life. By digitizing the video and storing it in a secure mass storage system we not only create a copy that does not degrade but we will enable access to materials that have typically only been available to the scholars who made the recordings.

At the end of the development grant we anticipate the following outcomes:

1. 150 hours of unedited ethnographic video annotated, cataloged, and published to the web for retrieval at Indiana University and University of Michigan.

2. 10 hours of video that has been given special attention for pedagogical purposes. We intend for each participating scholar to create a lesson or cluster of lessons from their video material that has been given special analytical and pedagogical attention. We expect each scholar to utilize approximately one hour of their material for his purpose. Like the other video it will be cataloged and published to the web for retrieval at Indiana University and University of Michigan
3. Board of Directors selected and functioning.
4. A model for transforming and preserving ethnographic video data as well as making it accessible on the web for research and teaching purposes.
5. New linkages between two public universities for future cooperation.
6. A digital archive of video ready for expansion. In addition it will serve as a model for other projects.
7. A full statement on ethics and intellectual property as it relates to material like ours and its availability online.
8. An analysis of the costs of the project.

A key element of the deposition and cataloging process will be a detailed annotation of the video content. Many of these recordings are unique documents of events for which few scholarly experts may exist and these annotations are a necessary part of the process. Today's technologies support video annotation in ways not previously possible. While our current focus is on ethnomusicologists, scholars in related disciplines face the same problems: videotape degrades quickly, copies suffer significant degradation, playback of the original tapes is extremely damaging to them, and proper annotation of the video requires a significant investment of time and energy. The EVIA Digital Archive project offers a solution to all of these issues and can either expand or serve as a model for scholars in these other disciplines.

### **Long Term Sustainability**

This project fits extremely well with the developing technology infrastructure and digital library programs at both Michigan and Indiana. We have clear commitments from the directors of these areas, indicating that they are anxious to sustain this project into the future—indeed Kristine Brancolini of the IU Digital Library Project has been an active participant of all three workshops and Michael McRobbie, Vice-President for Information Technology, enthusiastically welcomes this project as part of IU's strategic initiative for massive storage and digital libraries. He has provided planning support and wants the technology work integrated into the IU system. James Hilton will not only serve as our Intellectual Property Coordinator, but as the lead technology administrator at the University of Michigan he will insure that the EVIA Digital Archive is incorporated into U-M's information technology infrastructures.

In addition, we intend to apply to the Mellon Foundation for another year of funding for the beginning of our growth phase after the two-year development phase. We also intend to work with other granting agencies to fund particular parts of this ongoing project. For example, the CIC may provide funding as part of an Internet2 demonstration project to extend access to the EVIA Digital Archive beyond Indiana University and the University of Michigan. In another case, a scholar might obtain funding from the National

Endowment for the Humanities to devote time to annotating their video. In yet another case, the Ameritech Fellows program may fund a scholar to develop pedagogical materials from what is in the archive.

The long term sustenance and growth of EVIA-DA will begin in the development phase as we work to institutionalize EVIA-DA and embed it in such a way that it will be viable and flourishing once the grant funding concludes. The details of that future will be finalized during the development stage. In broad outline, we have had active participation in the planning grant by key individuals from the Archives of Traditional Music (IU), the Digital Music Library (IU), and the Media Union (UM). These individuals have indicated strong support for this project and a willingness to fold it into the Digital Music Library and Archives of Traditional Music, two institutions that have a record of cooperation in the area of digitization. The Archives of Traditional Music will provide storage for the Digibeta copies and provide cataloging for new entries into the archive once the grant-supported phase is completed. Furthermore, the Director of Digital Initiatives at the Archives of Traditional Music will be designated to work .1 FTE to oversee the continuity of the project once the grant concludes. The Digital Music Library will provide the migration of files to new technologies as they are adopted and become the optimal format for storage and retrieval. The Media Union is committed to providing key technical support along the way. EVIA-DA will be anchored at Indiana University, but will be linked in strong ways with University of Michigan for certain key areas of support. Both Michigan and Indiana have focused on interdisciplinary work in technology.

During the development phase the project directors in consultation with the various staff members will investigate the viability of a number of options for the future of EVIA-DA following implementation that might include (1) licensing institutions that want access to the archive, or (2) underwriting the archive by Indiana University and University of Michigan. In the former case, those institutions providing additional data for the archive could receive credits that would be applied toward the licensing fee in much the same way that institutions participating in the OCLC system receive credits for original cataloging that is added to the system. Over the long term, once the archive has built a broad base of geographically diverse material, we can conceive of charging an institutional membership for participation. This is a question we will address during the proposed development phase.

### Governance

During the development phase, a Board of Directors will be created by the co-project directors with the advice of key participants from the planning grant phase. This board, along with the policies for its selection and continuation will be created. The board will be composed of representatives from the two universities in the areas of research and pedagogy, technology, and intellectual property will provide guidance in the following areas: (1) institutionalizing the archive within Michigan and Indiana University; (2) planning for the selection of the fellows who will participate in the growth phase.

## **Budget Narrative**

### **Salaries and Wages**

The bulk of the budget will be used for salaries and wages. Most will fund a team of software and database developers whose positions will end once the development stage is complete. Other positions are integrated into their respective university infrastructures and will continue beyond the development stage. A core development team will be based at Indiana University and they will work in concert with a smaller team based at the University of Michigan who will be focused primarily on encoding issues. The development team at IU will be hired and employed through University Information Technology Services (UITs). Positions are for two years unless otherwise noted.

### **Co-Principal Investigator**

Ruth Stone, Ph.D.  
Director, Ethnomusicology Institute  
Professor, The Department of Folklore and Ethnomusicology  
Indiana University

Co-Principal Investigators Ruth Stone and Lester Monts will guide the project from their respective institutions and will work to further the relationship of the project to the institutional infrastructures at their home institutions and beyond. They will serve as representatives for the project and as consultants on administrative aspects of the project and its mission. They will each devote .1 FTE to the project as an in-kind contribution.

### **Executive Investigator**

Alan Burdette, Ph.D.  
Director of Digital Initiatives, The Archives of Traditional Music  
Director, SAVAIL  
Adjunct Assistant Professor of Folklore and Ethnomusicology  
Indiana University  
Executive Director, The Society for Ethnomusicology

Working through his position as Director of Digital Initiatives at the Archives of Traditional Music and Director of SAVAIL, Alan Burdette will ensure that the project remains on schedule, will oversee budgetary concerns, coordinate all hiring, and will serve as a liaison between the Principal Investigators and the various development teams. He will also ensure that the different teams are in continual communication about each other's work. He will devote .25 FTE to the project.<sup>9</sup> As manager of the planning phase and as key organizer of the development phase proposal, he is well-suited to overseeing the development phase.

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<sup>9</sup> Dr. Burdette has a full time position that is split in 3 ways: .50 FTE of his employment is as the Executive Director of the Society for Ethnomusicology, .25 FTE is as the Director of SAVAIL, and .25 FTE is as the Director of Digital Initiatives at the Archives of Traditional Music. The quarter segment devoted to the Archives of Traditional Music has been funded through grant support.

GA Administrative Assistant (.375 FTE)

This graduate assistant will work closely with the Executive Investigator and the Research and Pedagogy Coordinator to support administrative tasks of the project. This individual will assist with documenting the project efforts, scheduling, travel arrangements, budget management, and communication among project personnel.

Research, Pedagogy and Intellectual Property Coordinator (Full time)

The Research, Pedagogy and Intellectual Property Coordinator will work with the participants of the planning project and the development team to implement several key areas of the project. For this full time position we will be looking for someone with advanced training in ethnomusicology and excellent administrative skills. This individual will work closely with the Research and Pedagogy Coordinator based at the University of Michigan. Duties will focus on the following areas:

- 1) Interface with the technology team and guide them with regard to the content that is to be posted on the web
- 2) Survey the faculty for the summer workshop regarding materials to be submitted for deposition and annotation
- 3) Serve as a liaison with the technology team on intellectual property issues
- 4) Coordinate and supervise arrangements for the summer workshop
- 5) Coordinate final publication of annotations on the web in consultation with the various teams and the participating scholars.
- 6) Work with ethnomusicologists and technologists to provide annotation models and pedagogical models for depositing scholars
- 7) Develop accessioning selection criteria for Board approval
- 8) Work with intellectual property consultants on refining forms to be used in ethnographic documentation and deposition.
- 9) Work with ethnomusicologists to develop ethical guidelines for the archive and depositors.
- 10) Work with ethnomusicologists and intellectual property consultants to plan forum on ethics, intellectual property and the EVIA Digital Archive at the 2003 SEM conference.
- 11) Develop plans for the utilization of supplemental materials beyond video (such as audio and still images)

Technical Investigators (.1 FTE each)

Jon Dunn

Assistant Director for Technology, Digital Library Program  
Indiana University

Doug Pearson

Manager, Digital Media Network Services  
University Information Technology Services  
Indiana University

Technology administrators at IU and U-M will oversee and coordinate the development team and encoding work at their respective institutions. They will also remain in close contact with each other so that the work across institutions is coordinated and compatible. Jon Dunn and Doug Pearson will work from different divisions within UITS to oversee the software development team, to ensure that it follows institutional guidelines, and to serve as resources for the developers. They also represent two key areas of long-term support for the project: the Digital Library Program and Digital Media Network Services. They will supervise hiring of technologists through UITS.

#### Systems Analyst/Technology Coordinator (Full Time)

The full time systems analyst will work with the archivists, collection managers, project investigators and coordinators to develop a complete specification of the application requirements and will translate the requirements definition to a technical system design. Working under guidance of the technical investigators, the systems analyst will lead the system development activities and will perform additional activities, not limited to: parse development assignments to programmers and graduate assistants and guide their work; interface with institutional IT departments to coordinate human and machine assets; define standards and procedures for system development and design; define the technical process for accession through publication; interface with the metadata, pedagogy and intellectual property teams; guide open source development and publication methodologies; guide design and development in terms of institutional design constraints, e.g., OAI compliance; develop data integrity policies and procedures; develop system test plan and testbed; develop the technical manifestation of digital rights policies and procedures; and design and guide the implementation of the interface to existing library systems, e.g., MARC catalog.

#### Programmer I (Full Time)

Programmer I will participate in the development of technical system design to application requirements. Under the direction of the systems analyst, the programmer will implement technical system design as programmatic constructs, with concentration on database and system core components, including: database; data storage; data manipulation; data integrity; search and retrieval; media synchronization; ingestion process; work flow systems; networking considerations for media delivery; logging and reporting systems; technical support for implementation; technical system documentation.

#### Programmer II (Full Time)

Programmer II will participate in the development of technical system design to application requirements. Under the direction of the systems analyst, the programmer will implement technical system design as programmatic constructs, with concentration on user interface design and development, including: work flow, cataloging, annotation, search and retrieval, access, and administrative interfaces; synchronized multimedia display; use scenarios; usability design; interface mockups; usability testing; user documentation; technical documentation; and technical and user support for implementation.

GA Programming (.375 FTE)

Under the direction of the Systems Analyst, the programming GA will provide assistance to the analyst and programmers for various development tasks, not limited to: basic programming tasks; documentation; usability testing; and system test bed. Indiana University will pay their fee remission and we are asking the Mellon Foundation to pay their salaries and benefits.

Cataloging Supervisor (.1 FTE)

Suzanne Mudge  
Librarian, Archives of Traditional Music  
Indiana University

Suzanne Mudge will serve as a consultant to the development team as it creates the metadata scheme and will supervise and assist in the hiring of an hourly cataloger.

Hourly Cataloger (10 hours per week)

This cataloger will work directly with depositing scholars to catalog their materials and to ensure that their annotations follow subject term conventions that will allow for the creation of detailed descriptions in the MARC catalog records.

**Fringe Benefits**

Fringe benefits have been calculated according to guidelines set by Indiana University.

### EVIA Digital Archive Communication Chain

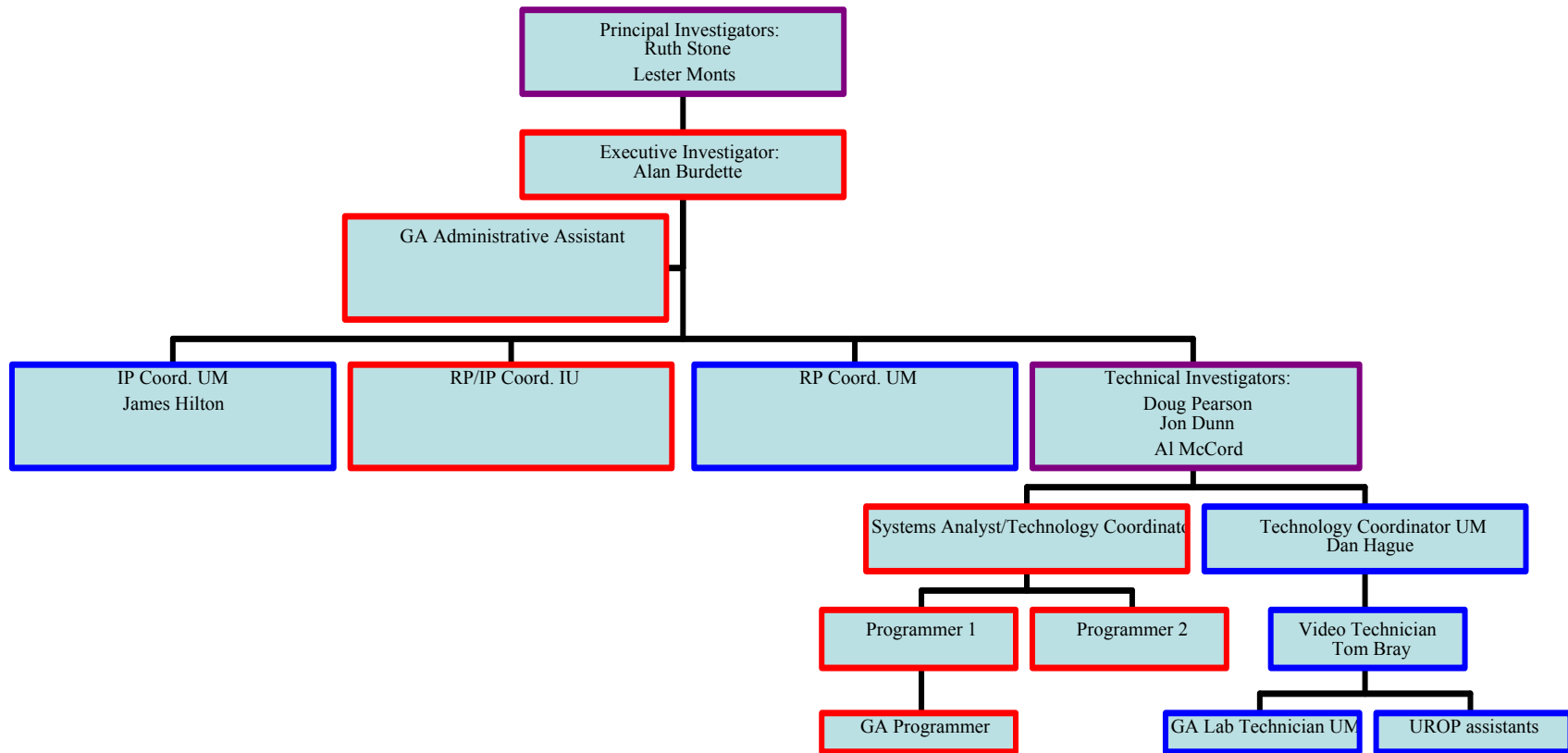


Figure 4

## **Equipment**

The transcoding workstation will perform the work of converting the 50 Mbps I-frame only MPEG-2 files into file formats that can be streamed, which requires significant memory and number-crunching capabilities.

## **Supplies**

Supplies for development team staff include blank computer storage media for file back-up, and miscellaneous paper supplies (post-it notes, notepads, etc.). Supplies also include toner cartridges for the shared staff printer.

## **Travel**

### Conference Participation

We have budgeted funds to provide for attendance at 6 conferences during the development phase. Depending on project needs and personnel availability, one project staff person will be sent to represent the project to conferences on digital libraries, Internet2, and ethnomusicology. The purpose of this conference travel is to both gain important information on current developments in these respective areas as well as to present information about the EVIA Digital Archive project in order to get feedback for further refinement.

### Summer Institute

During the last stage of the development phase, ethnomusicologists from the initial planning phase will be invited to participate in a two-week long summer institute during which they will be working on annotating their own video and evaluating the process. We are estimating that eight of the participants will need to travel to Bloomington.

The workshop in the summer of 2004 will bring approximately 12 scholars together for two weeks of intensive work in annotation. Through collaboration with one another and the technology and intellectual property support staff, they will also be testing interface design. As the scholars prepare their one-hour of teaching material, they will have an opportunity to present to one another and to selected students in order to further refine their annotations and the process itself.

The workshop schedule will be structured as follows:

#### Week 1

Mornings: Annotation of 10 hours of tapes and consultation with support staff

Afternoons: Seminar to present problems, discuss solutions

Evening: Additional independent work on annotation

#### Week 2

Morning: Edit and Annotate 1 hour of teaching video in consultation with support staff

Afternoon: Seminar present samples of annotated videotape for comments

Evening: Discussion on the next phase of the project.

### IP and Ethics Forum at SEM

In order to publicize the work of the intellectual property team and to take the discussions into a more complex ethical phase, we are proposing a forum at the 2003 meeting of the Society for Ethnomusicology. Four project representatives will give presentations and initiate a dialog about the ethical issues involved in the project. We anticipate that this forum will generate a great deal of interest and provide the project with very useful feedback.

### Development Team Meetings

We will rely on video conferencing whenever possible, but face-to-face meetings are still important. Twice a year—once in Ann Arbor and once in Bloomington—a small representative group will meet for a day to work out pressing issues related to the project development.

## **Other Costs**

### Office Rental on IU campus

#### **Personnel offices**

The development team and certain administrative functions will require office space, furniture, workstations, and setup of phone and data lines. A location where all offices can be adjacent to each other has been reserved on the IU campus. Full-time personnel will have their own offices and part-time graduate assistants will share office space. A total of five 144 square foot offices will be required. The GA programmer, GA administrative assistant and the .25 FTE Executive Investigator will share an office space.

Because of the importance of coordination between the institutions and the various teams of this project, a suitable meeting place with projection capabilities and appropriate hardware is a necessity. The IU offices will be contiguous to offices of the Society for Ethnomusicology, and the OnLiberia Project, and so they will share the cost of a copy machine. The figures listed above also include costs for office supplies, communication expenses and mailing expenses.

#### **Conference Room**

To provide space for the development team to meet with each other as well as to meet with other project personnel, we have budgeted for a small conference room that will be contiguous to the offices of the development personnel. The room will be outfitted with a digital projector, screen, CPU, a white board, table, chairs, and a speakerphone for conference calls.

#### **EVIADA/SAVAIL**

To support the work of the development team, IU scholars, and that of the depositing fellows, a lab facility will be expanded. SAVAIL (Sound and Video Analysis and Instruction Lab) at IU will provide equipment and staff expertise but will require expansion and some equipment upgrades to fully serve the needs of this project. Funding will add three workstations and necessary accessories and software. SAVAIL currently contains basic video and sound editing workstations equivalent to approximately \$25,000. A graduate assistant that is regularly assigned to the lab will be able to assist visiting EVIA Digital Archive fellows.

In order to begin testing the process as early as possible and to build up some sample video and annotations for the development team, ethnomusicologists at IU will begin annotating their video as soon as possible. The additional workstations in SAVAIL will provide workspaces for IU scholars to begin annotating their video before the summer institute. These workstations will be used by participants during the 2004 summer institute and by later visiting fellows.

SAVAIL will provide a base and a long-term support relationship for the EVIA Digital Archive from within the Folklore and Ethnomusicology department at IU. It helps tie the EVIA Digital Archive to the academic and pedagogical mission of the department and of the faculty working at IU.

In order to serve the needs of the EVIA Digital Archive, SAVAIL would have to be moved near the development team offices, and to provide a larger space to accommodate EVIA Digital Archive users. The Folklore and Ethnomusicology department would cover the costs of moving.<sup>10</sup>

#### Office Setup and Services

Development team offices, SAVAIL, and the conference room will all require the setup of phones, a piece of carpet, and blinds for the windows. A copy machine will be leased and the cost shared among several units in the same building.

We expect to have some minimal mailing expenses for sending materials to UM team members and project participants. Depositors will be expected to cover the expense of shipping their videotapes to the dubbing/encoding lab.

Development team offices will be provided with a voicemail system through Indiana University. Minimum setup and maintenance fees are required. We also expect to have some long distance expenses associated with keeping in touch with U-M and necessary experts outside of Bloomington.

#### Data Storage and Streaming

**Mass Storage.** Four terabytes of data storage in IU's MDSS facility will be provided as an in-kind contribution. This data is enough for approximately 150 hours of 50 Mbps I-frame only video. The MDSS system is "near-line" with data being stored on large magnetic tape reels and accessed by a robotic system. This data is automatically mirrored at a site on the IUPUI campus in Indianapolis, making a total of 8 terabytes.

**Streaming Server.** For actual streaming of the video a 600 GB streaming server is required. This server will allow immediate playback of files and clips for multiple simultaneous users and will utilize the capabilities for **Telestream FlipFactory software** to transcode the high-quality files on the fly to the file format requested by the user.

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<sup>10</sup> By the time the development phase is complete, the Folklore and Ethnomusicology department, SAVAIL, and any remaining EVIA Digital Archive offices that are expected to be needed will be moved to a new facility on campus and no room rental charges would be applicable

We expect that the development team will need special **software and site licenses** for software development but until we have the development team assembled, we do not know exactly what those needs will be. We have budgeted \$2500 each year.

#### Stipends and Fee Remissions

**Summer Institute.** Ethnomusicologists participating in the summer institute we have planned for annotating video and evaluating the process as well as the state of the archive development, will be given a stipend of \$3000 to pay for their contributions over the two-week period.

**Graduate Student Fee Remissions.** Fee remissions for two graduate students will be covered as an in-kind contribution by Indiana University. Costs have been estimated using figures for out-of-state tuition.

#### Consulting

**Legal.** For remaining legal issues and for consultation on the legal/ethics forum we have planned for the October 2003 SEM meeting, we will again use the services of Robert Meitus at the Baker and Daniels law firm in Indianapolis. At \$250 an hour, the budget figures will give us 6 hours of legal consultation per year.

**Video Preservation.** We will rely on consultation services from video preservation expert James Lindner to address special issues for video that is in poor condition.

#### Expendable Equipment

The five new development team office spaces will need to be equipped with basic **furniture** and **computer workstations**. In addition, the **conference room** will need a large table, chairs, a white board, video projector, a CPU, and a projection screen. The conference room is designed to facilitate the gathering of development team personnel with each other, with administrative personnel and with guests.

SAVAIL is currently outfitted with 3 workstations that are used by Folklore and Ethnomusicology department faculty and students and would be available for use by project staff and fellows. Our request increases those workstations by three in order to:

- 1) Provide development team staff with video monitors to view and evaluate video
- 2) Provide IU faculty with an environment to annotate video in close collaboration with development team.
- 3) Provide summer institute fellows with workstations to annotate and work in proximity to development team.
- 4) Provide all of these personnel with a support staff through SAVAIL for assistance with technology questions.

SAVAIL would also serve as a secure location to locate a shared printer and FAX machine for project staff. Room dividers will offer some privacy and sound damping for annotating scholars and for development team work.

## **Subcontracting—The University of Michigan**

### Co-Principal Investigator (.1 FTE)

Lester Monts, Ph.D.  
Senior Vice Provost for Academic Affairs  
Professor, School of Music  
The University of Michigan

The Co-Principal Investigators will guide the project from their respective institutions and will work to further the relationship of the project to the institutional infrastructures both at their home institutions and beyond. They will serve as representatives for the project and as consultants on administrative aspects of the project and its mission. They will each devote .1 FTE to the project as an in-kind contribution.

### Technical Investigator (.1 FTE)

Alan McCord  
Senior Director, IT Planning and Coordination  
Information Technology Central Services  
The University of Michigan

Technology administrators at IU and U-M will oversee and coordinate the development team and encoding work at their respective institutions. They will also remain in close contact with each other so that the work across institutions is coordinated and compatible. Alan McCord will work with Jon Dunn and Doug Pearson at IU to oversee the software development team and ensure that it follows institutional guidelines. He will also serve as a resource for the developers. He is centrally involved in U-M's creation of a Digital Asset Management System and will help guide the EVIA Digital Archive's development so that it will remain compatible with infrastructure developments at U-M. He will also supervise hiring of technologists at U-M.

### Technology Coordinator (.1 FTE)

Dan Hague  
Senior Engineer, IT Communications Division  
Information Technology Department  
The University of Michigan

Dan Hague will coordinate technology efforts at U-M and serve as a liaison between the encoding team at U-M and the development team at IU.

### Video Technologist (.1 FTE)

R. Thomas Bray  
Manager, Media Systems and Support  
Media Union  
The University of Michigan

Tom Bray will supervise the dubbing and encoding process and personnel at the U-M Media Union. He will do any necessary training of graduate students who are working as part of the project.

#### R&P Coordinator (.2 FTE)

The Research and Pedagogy Coordinator will be a portion of a larger administrative position at the World Performance Studies Center at the Media Union. We will be searching for someone with an advanced degree in ethnomusicology and excellent administrative skills. This individual will work with the RP/IP Coordinator at IU to coordinate efforts between the two universities and to develop pedagogical and annotation models for the depositing scholars. This individual will also perform a full survey of curriculums in ethnomusicology around the country and create plans for the participation of other scholars and institutions after the development phase.

#### Intellectual Property Coordinator (.1 FTE)

James Hilton

Associate Provost for Academic, Information and Instructional Technology  
Affairs

Professor of Psychology  
The University of Michigan

James Hilton served on the Intellectual Property Team of the planning project and will advise and help coordinate the efforts in the IP realm for the development phase. He will devote .1 FTE of his time to this project as an in-kind contribution. The focus of the IP work during this development phase will be to turn the recommendations created during the planning phase into working policy and to ensure that technology systems are well integrated with IP policies. Dr. Hilton will spearhead the necessary efforts for turning strategies recommendations from the planning phase into implemented policy. He will also shape the focus of the forum on legal and ethnical issues planned for the 2003 SEM conference and oversee the integration of the results of those discussions into the EVIA Digital Archive's procedures.

#### Lab Technician GA (video) (.375 FTE)

This graduate assistant will assist in the Media Union encoding lab. Working under the supervision of Tom Bray, this individual will do the digital encoding and the dubbing to Digibeta. The University of Michigan will pay the graduate assistant fee remission, and we are asking the Mellon Foundation to pay the salary.

#### Lab Assistants (UROP)

The University of Michigan's undergraduate Research Opportunities Program will place a select undergraduate in the Media Union encoding lab to assist with dubbing and encoding duties as needed. This program allows undergraduates to get first hand experience working on grant projects. The salary will be supported by the U-M's UROP program for four semesters.

#### Hourly Graphic Designer (80 hours total)

A graphic designer will be hired on an hourly basis to provide a visually appropriate interface for the various web page environments we will need for the archive. We will rely on the graphic designers in U-M's digital library production service and thus will benefit from their experience

on projects like ours. We estimate that we will need 80 hours of design work over the course of the development phase at \$50 an hour.

### **Fringe Benefits**

Fringe benefits have been calculated according to guidelines set by the University of Michigan.

### **Equipment**

A lab will also be set up in the Media Union of the UM, and like SAVAIL, will rely on existing equipment with requirements for some new purchases. The lab at UM will serve dubbing and encoding functions.

**Digital Betacam video deck.** A component of our archival strategy is to create Digibeta preservation masters. These will be created in a lab devoted to this project in the Media Union at the University of Michigan. While they can provide decks for the wide variety of formats we will encounter, they do not have a Digibeta record deck and this would be a necessary purchase.

**Encoding file storage.** A Vela Argus MPEG-2 digital video encoder will be provided for use on the project by the University of Michigan. In order to temporarily store those files before sending them to the MassStor system at Indiana University, technicians will need hard drive space. One terabyte of spinning hard disc and a chassis would be combined with an ISCSI controller contributed by the University of Michigan to provide temporary storage for up to 35 hours of video while technologists encode videotape and prepare the digital files before sending them to the MassStor system.

### **Supplies**

**Digibeta tape stock.** Creating Digibeta preservation masters will require purchasing blank tape stock. Based on the length of the original source tapes we have estimated a need for an even split between both one-hour and two-hour blanks for a total of 150 hours.

### **Other Costs**

#### Expendable Equipment

Two computer workstations will be necessary for running encoding hardware, database access, and file transfer functions in the Media Union lab.

#### Fee Remission

The University of Michigan will provide a fee remission for a graduate assistant at the estimated out-of-state tuition cost.

#### Lab Setup

Connecting equipment in the Media Union lab will require miscellaneous network and cabling expenses. Space rental in the Media Union is being provided as an in-kind contribution by the University of Michigan.

## **Budget Summary**

For comparative purposes the following figures represent a rearrangement of the costs into functional categories. These categories show the joint costs in six areas of the development phase.

### Administrative

These costs consist of salaries, fringe benefits, and fee remissions for personnel concerned with the general administrative functions of the project for the two-year development period. Some of these expenses could be expected to remain once the development phase is over and the EVIA Digital Archive moves into regular implementation.

Mellon: \$119,107                      In-kind: \$123,395

### Development

Development expenses include the salaries of technologists and administrators directly concerned with the creation of the EVIA Digital Archive system. They also include office and expendable equipment expenses associated with those personnel. Few of these expenses would be expected to remain part of the operating costs once the archive is implemented.

Mellon: \$480,273                      In-kind: \$190,837

### Selection

Under full implementation, Selection is the area of the project devoted to choosing what depositors to work with. That process is largely decided already for this development phase, but there are some administrative costs associated with selection as well as with developing detailed plans and procedures for the future. Thus it is a small part of the overall costs, and it is likely to remain so in the future.

Mellon: \$58,260                      In-kind: \$0

### Ingestion

The processing of video for storage and delivery represents an important cost of the project. These expenses include technical personnel for dubbing and encoding, Digibeta hardware and blank tape, workstations, short-term hard drive space and long-term massive data storage. Many of these expenses will continue past the development phase, but the large investment in equipment will remain useful for several years.

Mellon: \$109,675                      In-kind: \$130,572

### Resource Preparation

These costs include those associated with creating annotations, finding aids, and pedagogical materials for the video. In addition to travel, stipends, and cataloging, these costs include workstations for supporting the annotation work of scholars.

Mellon: \$74,659                      In-kind: \$16,610

Publication

Publication costs include hardware and software for streaming as well as some legal support for refining our IP policies. These expenses would drop significantly after development because of the investment in hardware and software made up front.

	Mellon: \$33,000.00	In-kind: \$37, 000.00
Total	Mellon: \$874,973	In-kind: \$498,415

## Appendices

### **I. Usage Scenarios**

Perhaps the best way to understand the promise of the EVIA Digital Archive is to imagine several different usage scenarios. The archive will facilitate teaching and research possibilities that are rather cumbersome at the moment, and it is important to remember that most of the video described in these scenarios is currently unavailable. Following are a few of the possible uses of the EVIA Digital Archive.

#### Scenario 1: In the lower undergraduate classroom

Professor Kunst teaches an undergraduate survey course in world music and prepares a lecture on Indonesian gamelan music. There are 120 students in the class. Using the EVIA Digital Archive during the week prior to class, Dr. Kunst searches the archive for broad key terms that related to the core keywords she wants her students to understand: gamelan, Indonesia, idiophone, trance, and ritual. She finds 20 collections that fit one or more of her criteria, with ritual drawing the largest number. Gamelan and Indonesia draw 3 collections and she chooses one from Bali and one from Java, both, containing examples of gamelan performances. Within the Javanese collection, the performances are all more concert-like, but they offer good perspectives on the instrumentation of the gamelan orchestra and its distinctive sound is easy to discern. The Balinese collection contains two examples she wishes to use. One is a village concert which, like the Javanese example, shows the instrumentation and sound well. The other occurs within a ritual context and the gamelan is just one part of an intense multimedia event with costumes, ritual food, dancing and trance-inducing ritual activities. Other results of her search come up with struck idiophone examples from South America and Africa, trance inducing ritual from Haiti, and footage from a *dangdut* concert in Jakarta. During the week prior to class she selects short segments of the video and creates her own personal bin files that point to the exact segments she wants. She uses these examples in the following ways over the 4 course meetings in which she discusses Indonesian music:

1. She shows 5 minutes of the concert footage of Javanese and Balinese gamelan performances. She asks the students to work in groups to compare and contrast their stylistic and instrumentation differences and then they discuss them as a class and with her guidance, they write a master list of the similarities and differences. She uses the archive to show brief snippets to re-illustrate particular points as they develop. These become the source for exam questions.
2. On another day she discusses Bali in more detail and shows a 15-minute clip of a temple renewal ritual. Dr. Kunst has selected short representative segments from the nearly 8 hours of video in the archive. Students are asked to write about the progression of events and how the ritual develops. She points out important symbolic dimensions of the costumes, food and music. At the culmination of the event, dancers are brought into trance. Students are given an assignment to look at a segment of Haitian *voudun* from the archive and discuss what role music seems to play in these rituals.
3. In another activity she illustrates the principles of the struck idiophone category of musical instruments by using a comparison between the gamelan orchestra, South American xylophones and West African balaphones. Short segments from the archive

allow the students to see the shared principles of sound creation. They are given an assignment to look up idiophones in the archive, find 6 examples and describe them.

4. In the last class of this unit, Dr. Kunst talks about a form of popular music in Indonesia called *dangdut*. Because she has only a basic knowledge of *dangdut*, she found the annotations accompanying the concert footage to be extremely useful for preparing her lecture and for contextualizing the short video of concert footage that she shows to her class.

### Scenario 2: In the upper undergraduate classroom

One of the units in Dr. Rousseau's course "Music, Religion and Ritual in Africa," is called "Music and Ritual: Aesthetic Foundations." Themes of the unit are:

1. "Art for Art's sake" or "Art for life's sake"?
2. Music as an integrated art form
3. Principles of aesthetics in the visual arts and in ritual settings

As a way to supplement reading assignments which clarify principles of art and aesthetics in African societies in both spatial and temporal forms, students are asked to log into the EVIA Digital Archive and explore several examples selected by the professor which have supportive analytical text on the basic conceptions, attitudes and modes of employment that define the aesthetic in African societies. One segment in particular focuses on the musical events and rituals of the Apostolic Revelation Church in Ghana. In this segment, events begin in the "sacred" space (temple, headquarters) and proceed and are consummated in public space, the town school compound. In this segment's performances, costume, symbols of the church, and public competitions among church choirs are shown. The multiple functions and channels of aesthetic action is illustrated as well as the fluid boundary between the "sacred" and the "secular." As an assignment students are asked to view a comparative video segment of African American Baptist church service and write a short paper that compares and contrasts issues of sacred/secular, private/public, and contemplative/utilitarian in this and the example from Ghana.

### Scenario 3: In the graduate classroom

Professor Sachs is teaching a graduate seminar on music and politics in Africa. The cross-listed course has only 6 students but they come from the departments of ethnomusicology, anthropology, musicology and African studies and he has found it to be a real challenge to speak to the different disciplinary traditions of the students. Thinking creatively, he gives his students the following assignment: Locate a segment of video in the EVIA Digital Archive that could be discussed in terms of African music and politics and analyze the material from the perspective of your own discipline. Then analyze the material in a way you think someone from one of the other disciplines in your class might approach it. The assignment will eventually be a class presentation but the students must turn in a rough draft to Dr. Sachs. This rough draft is posted on a website with a link to the bin file the students have created for the video clip of their choice. Dr. Sachs gives them suggestions on the disciplinary perspectives they have taken, their analytical methods, and the clip they have chosen. Prior to the class presentations, all of the class members are told which segments are being used and they are asked to watch them before class. The students give their presentations and show short examples of the video they have chosen. The final class projects are sent to the EVIA Digital Archive for possible inclusion in a special

data field that allows scholars other than depositors to make comments, analysis and contributions to the metadata.

#### Scenario 4: Other disciplinary possibilities

Because much of the material in the EVIA Digital Archive is ethnographic in nature it will have uses in pedagogical endeavors outside of the field of ethnomusicology. For example:

1. An undergraduate cultural anthropology class uses video from Guatemalan festivals to discuss syncretic religious practices in post-colonial Central America.
2. A graduate course in religious studies uses EVIA Digital Archive examples to compare Islamic worship practices throughout the world.
3. An undergraduate course in music appreciation looks at a Hindustani classical music performance from India as a brief introduction to other fine art musical traditional outside of Euro-American classical music.
4. Students in a graduate course in ethnographic methods read a well-known ethnomusicological monograph and then are asked to write a review and critique of that scholar's field video in relation to that monograph.
5. An undergraduate course in Spanish literature uses video of Andalusian gypsy music as a way to better understand some of the cultural contexts of their readings.

#### Scenario 5: The research scholar

Dr. Hornbostel, just having returned from a one-year research leave to study recent Latin American immigrant music in communities in southern Indiana, applies for and is awarded an EVIA Digital Archive fellowship. He spends a semester annotating video that he shot which shows musical performances at dances, church services, and house parties. He also has audio recordings of local Spanish language radio broadcasts, flyers, two hundred photographs, and several hundred pages of fieldnotes. During the annotation process he is able to immerse himself in the images he captured and by providing links to other scholars working with Latin American immigrant communities, he is able to engage in a dialogue about his emerging analysis. At the conclusion of his fellowship, he emerges with a rich knowledge of his own data and a draft of a monograph and 2 articles. When they eventually reach publication, links to illustrative video segments, audio recordings and images that are part of the EVIA Digital Archive become an important part of his presentation. Other scholars and members of the community he worked with are able to see the materials online and give him feedback on the annotations and analysis that appear with the digital assets.

#### Scenario 6: The not-so-distant future

Laura Densmore is a Ph.D. student doing fieldwork among nomadic herders in Mongolia. She is using a digital video camera to record music performances that blend centuries-old traditions with songs they hear on the radio. An unusual feature of these performances is the accompanying pantomimes that illustrate the meanings of the songs. One of her research questions involves the subtle interactions between performers and their audiences. Using a small satellite uplink, Laura records the video directly to the EVIA Digital Archive in Michigan and just in case, to her laptop hard drive. Later that evening, she accesses her growing collection in the archive and begins annotating the material she shot, developing new questions as she writes. The next day she

shows the video to some of the participants of the previous evenings performances and records their reactions. She asks them what certain elements of the performance mean to them and why they reacted the way they did at the time. That evening she responds to comments from a discussion group made up of colleagues back at the UC Santa Barbara campus where she is a student. They have further questions and comments about her annotations, her emerging analysis and the assumptions she seems to be making. The next morning she must pack because she and the people she is living with are moving to greener pastures.

## II. Intellectual Property Statements

### Intellectual Property Considerations

As a nonprofit educational project devoted to the creation, discovery and dissemination of knowledge of value in the field of ethnomusicology, EVIA-DA is committed to complying with all applicable laws regarding intellectual property. That commitment includes respect for copyright ownership and the full exercise of the “fair use” rights accorded to users of copyrighted works under Section 107 of the U.S. Copyright Act. 17 U.S.C. §107. To that end, EVIA-DA’s staff shall:

- avoid adopting policies or making use of materials that would infringe any copyrights;
- use good faith efforts to fully comply with copyright laws, including the Digital Millennium Copyright Act;
- research and keep abreast of developing copyright law in light of educational fair use and new technologies and the four factors for determining fair use rights set forth in 17 U.S.C. §107;
- provide for legal permissions for rights when or if necessary, it being understood that EVIA-DA may choose to request permissions for various reasons where fair use is believed, in good faith, to apply; and
- properly credit performers and authors of creative works and arrangements used in EVIA-DA, to the best of its ability. (For more details, see IP case studies 1 and 2 that accompany this proposal)

Beyond complying with applicable laws, EVIA-DA is committed to acting ethically in regard to the cultural property that it will transmit on the Internet. To that end we will continue the discussions that we have had with intellectual property experts as situations emerge and new contexts demand further deliberation.

Intellectual property is also an issue in regard to the computer programming that will be created for this project. We intend to select non-proprietary vendor-supported technology solutions wherever possible, and commit that any code that is written to support interface design will be open source, in accordance with Mellon Foundation guidelines, and available to other users who might be able to benefit from the investment we have made in developing such features as video screens with scrolling annotation running next to the image and linked to the sound.

### **III: Description of Eventual Growth Phase**

Our current proposal is for the development phase of the EVIA Digital Archive, but it is useful to see the project as it is imagined after full implementation as a way to contextualize the goals of the development phase.

1. Development phase: Indiana University and the University of Michigan
2. Growth phase: Gradual growth into the CIC universities
3. Mature phase: Gradual growth into other universities and educational institutions

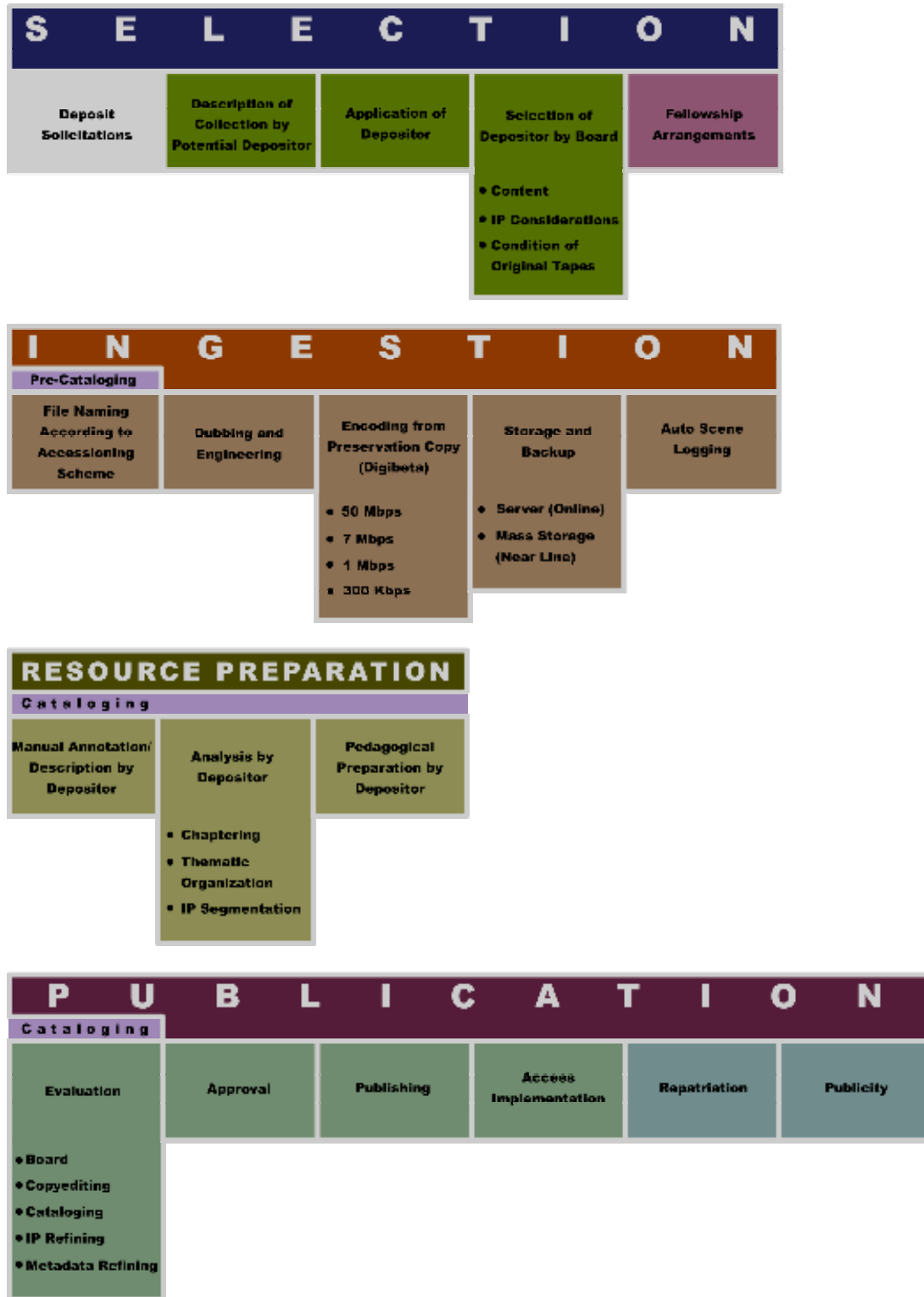
During the planning phase we developed a model describing how the production process would proceed. We will not fully implement these procedures during the proposed development phase, but the model serves as a guide for what we plan to do and establish for the growth phase. Please see the accompanying chart in Figure 5 or on the website.<sup>11</sup>

[www.indiana.edu/~eviada/protecteditems/workflowchart/index.htm](http://www.indiana.edu/~eviada/protecteditems/workflowchart/index.htm)

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<sup>11</sup> Access to protected parts of our website can be gained with the username: guest and the password: guest

Figure 5. Production Process Model



## Selection

The EVIA Digital Archive will first solicit depositions from ethnomusicologists. We would identify certain institutions that are viable participants<sup>12</sup> and request that ethnomusicologists at those institutions submit deposition proposals. We will begin with the planning project participants, expand to the larger group of Indiana University and University of Michigan participants, expand further to other CIC institutions, and then eventually include additional institutions. Participating institutions will need to have a reliable technology infrastructure in order for their participation in the project to succeed.

A potential depositor will prepare an inventory and a description of their video materials. Once their application is submitted, a project review board will examine the proposals and choose those that are most acceptable and complimentary to the breadth of material already accessioned. The board will make their decisions based on the nature of the content, the intellectual property conditions of the video, the physical condition of the original tapes, and the recording format of the original tapes. Once chosen, these depositors will be identified as fellows and will be expected to participate in a semester-long visiting fellowship program. This program will involve time devoted to annotating their video and teaching a course or lecture related to their fieldwork at the host institution. We imagine that there will be two fellows active in each semester to provide opportunities for dialog and collegial evaluation.<sup>13</sup>

## Ingestion

Once the depositor is selected, they would send their videos prior to the fellowship period so that ingestion could begin and they would have video ready to work with once the fellowship began. Videotapes and files would be assigned cataloging numbers. A video engineer will make a digital tape copy of the original tape. This digital tape will add time-code to the video and provide a physical tape copy for preservation purposes.<sup>14</sup> Once the engineer determines the best settings for an optimal dubbing, the Digital Betacam copy will be created and then that copy will be used for the digital encoding. The Digibeta copy will be deposited in the Archives of Traditional Music and the deposition arrangements will hopefully arrange for the original to be deposited in the ATM or another institutional archive. A 50Mbps MPEG-2 digital file will be created initially and then more highly compressed transcoded copies will be created from this file. These files will be a 7 Mbps MPEG-1, a 1 Mbps MPEG-1, and a 300Kbps Real or Windows Media stream. Each of these files has a different function. The 50Mbps file functions as a digital preservation copy from which later transcodings can be made. This file will be stored in the IU mass storage robotic tape system and mirrored on a similar system at IUPUI. This will provide a high degree of reliability. The 7 Mbps file will be roughly equivalent to DVD quality and will be used for large screen project in classrooms and presentations. The 1Mbps file will be used for general workstation use,

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<sup>12</sup> Viable participation would require a technological infrastructure that would support the high streaming levels. We would also require that the cataloging records we are creating would be able to be incorporated into their institution's library catalog.

<sup>13</sup> During the development phase described in this proposal, however, we will bring together a larger group for a shorter period of intense collaboration and evaluation.

<sup>14</sup> Currently, archivists have no generally accepted recommendations for digital video either because of longevity issues or expense. Digibeta, however, does have many adherents, most notably, the Library of Congress. We are currently proposing Digital Betacam because it offers a balance of affordability and reliability. The original tape formats are not likely to have native time-code and so a Digital Betacam dub creates a copy with time-code from which subsequent encodings can be made.

and the 300Kbps file will be used for low quality networks and thumbnail images of the video.<sup>15</sup> These three files will be placed on a streaming server. An additional step in the digital encoding will be applying scene-logging software to the video. This will provide a segmentation of the video that will give the depositor a useful place to begin as they add annotations later.

### Resource Preparation

Once the streaming files are available, the depositor will work with a web interface to annotate the video segments. Simultaneously, the depositor will work with a cataloger to provide consistency among search terms and content descriptions. A detailed MARC record will eventually be created that will be placed in the participating institutions' online catalog systems. The annotations by the depositor may include describing scene changes, providing context for the video, indicating themes, translating, transcribing, indicating special intellectual areas, indicating problematic ethical areas, and describing action. We are presently proposing that each depositor work with ten hours of video. Of that ten-hour collection, a special digital video presentation with greater analytical attention will be created that will focus on key issues and provide a more accessible pedagogical tool than the raw video. Here, key segments of the video(s) will be used.

### Publication

Once the depositor has made their annotations, the material will be evaluated in several areas. The Board will examine it for consistency with other holdings, it will be copyedited, intellectual property issues will be refined,<sup>16</sup> the metadata will be checked, and the cataloging records will be checked. Once approved, the video files will be "published" by establishing access through the participating institutions. Any access restrictions would be implemented at this time. Also, efforts will be made in some cases to "repatriate" video materials to communities or individuals who are the subjects of the video. This could take the form of providing Internet access to the archive, or by providing DVD or VHS copies. Finally, the EVIA Digital Archive would publicize the addition of new material to the archive.

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<sup>15</sup> "Low quality" is a relative term here. Most high-speed cable modems used in individuals' homes provide very fast Internet access, but they would have difficulty handling a 300Kbps video stream.

<sup>16</sup> Difficult intellectual property or ethical issues should be avoided in the initial selection process, but as a video is examined in more detail, issues may arise. If it develops that segments are identified with unsolvable intellectual property issues or with ethical issues that cannot be resolved, areas of the video asset may be restricted or "blacked-out" to streaming users (although they would be retained in the preservation file).

#### **IV. Characteristics of the Archive Video**

Ethnomusicologists refer to these recordings as “field recordings.” They will have been recorded under a wide variety of conditions, in different recording formats, and with varying degrees of expertise. The content is a valuable documentation of music and cultural practices that in many cases will have no comparison. They are unique and invaluable records of cultural history. They are especially valuable because they are typically part of a rich and long-term ethnographic encounter and cultural analysis by an ethnomusicologist. Thus, they are not isolated recordings but are part of a larger documentary and analytical endeavor over a long period of time.

Most of these recordings will have been made on consumer or prosumer-level video cameras. Most will have been made “on location” with natural lighting (no additional video lighting), with the audio recorded using either the built-in microphone or with an external microphone run into the camera’s audio inputs. In some cases the footage will have been shot handheld (without a tripod). Most examples will contain high levels of background activity and there is a need for retention of both foreground and background detail for historical and analytical purposes. From a video compression and streaming standpoint, all of this visual detail presents challenges.

We expect to encounter a wide variety of formats, most typically: 1/2” VHS (oldest examples in Black and white), SVHS, Beta, 8mm, Hi8mm, Digital 8, MiniDV, and DVCAM. The oldest recordings will be on open-reel videotape (typically 1/2”). Of course, some will have been made on film, both black and white and color.

**V: Planning Project Personnel.**  
**July 1, 2001 to July 31, 2002**

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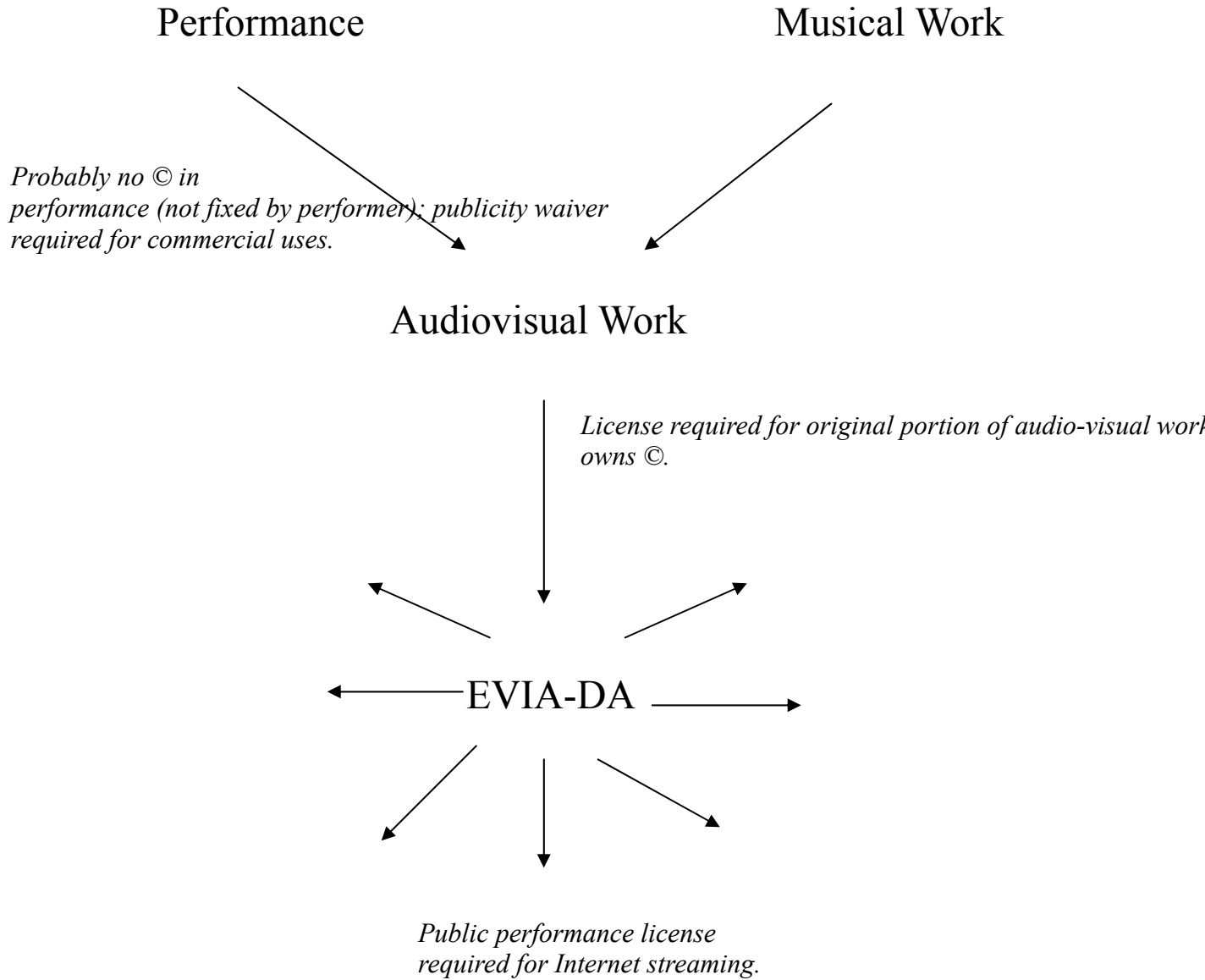
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ATTACHMENT A

*Ownership Rights and Licenses Required for EVIA-DA*



**ATTACHMENT B**

***Non-Profit Copyright and Publicity Permission Form***

I, \_\_\_\_\_, grant you, \_\_\_\_\_, the following permission(s), with the understanding that all uses of my performance(s), songs or other works, name or likeness, as they appear on the videotape you are making, will be for nonprofit, educational purposes. I understand that all rights may be transferred to others without limit; are for the entire world; and shall last the entire duration of any copyright or other protection. I agree that I have received sufficient consideration and that no other royalties shall be paid to me.

***Works*** I am the owner of the copyright in all songs or other works listed below, and I grant you the right to make a videotape using the song(s) and to reproduce, adapt, display and perform this videotape on the Internet or by any other means.

\_\_\_ (initials)

***Arrangements*** I am the owner of the copyright in all arrangement(s) of the songs listed below, and I grant you the right to make a videotape using the arrangement(s) and to reproduce, adapt, display and perform this videotape on the Internet or by any other means.

\_\_\_ (initials)

***Performances*** I am the performer who will be videotaped, and I grant you the right to use my name, likeness and voice in connection with the use of the videotape described above

\_\_\_ (initials)

Agreed to: \_\_\_\_\_ Date: \_\_\_\_\_  
 (Signature)

Identify titles of works and owners of works and arrangements (if other than you):

<i>Title of song, choreographed work or dramatic work, etc. ("Work")</i>	<i>Name of owner of Work or list as "traditional"</i>	<i>Name of owner of "arrangement" if different than owner of Work</i>

ATTACHMENT C

*Sample License Form for Ethnomusicologists*

I grant EVIA-DA a nonexclusive, worldwide license to reproduce, adapt and publicly display and/or perform on the Internet or a similar global computer network the videotape identified below for the entire term of its copyright, digitally or in any other medium now know or to be discovered, and solely for nonprofit, educational purposes.

I agree that the exposure of my materials on EVIA-DA is fair and adequate consideration under this agreement and that I will not receive future royalties.

I attest that I am the owner of the copyright in the videotape and to the best of my knowledge, the videotape does not infringe anyone's proprietary rights, including copyright or trademark rights or rights of publicity or of privacy.

Agreed to: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Date: \_\_\_\_\_

Description of videotape:

## ATTACHMENT D



### *Policy on Intellectual Property Rights for Education and Research Purposes*

As a nonprofit educational project devoted to the creation, discovery and dissemination of knowledge of value in the field of ethnomusicology, EVIA-DA is committed to complying with all applicable laws regarding intellectual property. That commitment includes respect for copyright ownership and the full exercise of the “fair use” rights accorded to users of copyrighted works under Section 107 of the U.S. Copyright Act. 17 U.S.C. §107. To that end, EVIA-DA’s staff shall:

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