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Association Internationale d'Archives Sonores et Audiovisuelles

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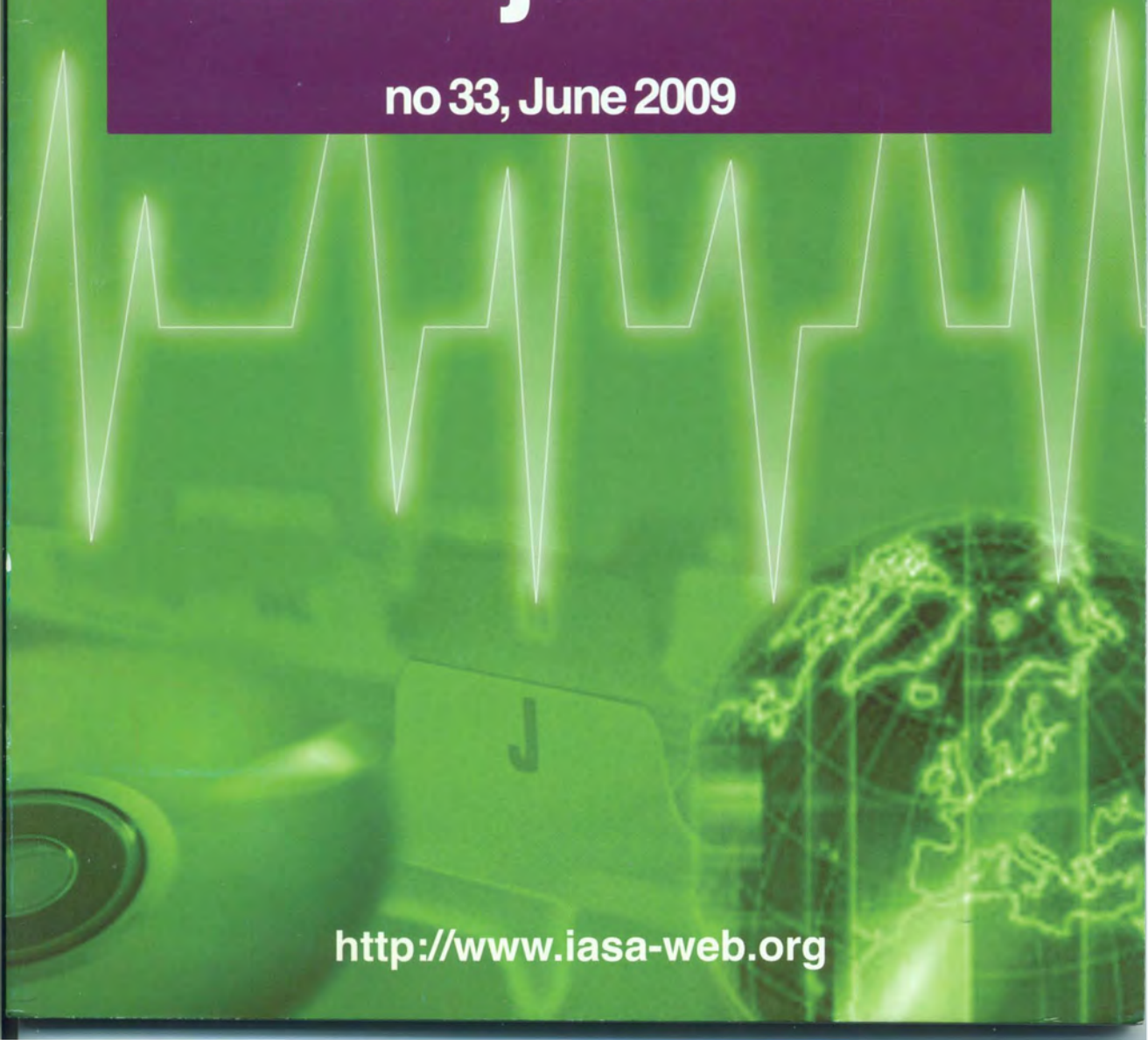

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This issue develops my idea, expressed in my previous editorial, to include a mix of articles mainly drawn from our conferences but reworked for publication. You'll notice that it contains fewer articles than usual. They are longer papers, however, where the authors have based their articles on presentations delivered at the IASA conference in Sydney in 2008, but have taken the opportunity to expand their arguments and to provide more detail. For example, David Nathan's paper, 'The soundness of documentation: towards an epistemology for audio in documentary linguistics', was delivered in an early form in Sydney. He then spent several months rethinking, reworking and conducting further research, presenting again in Hawai'i in April 2009. It's thus hot off the press, thinking on the move, and is illustrative of the "never static" situation we find ourselves in in the audiovisual archiving world in the 21st Century.

I have also tried to gather articles loosely into themes so that we begin to witness new thinking on particular strands of our work. In the last issue I drew on papers dealing in some way with "connecting with communities". In this issue the pieces highlight the increasingly important issue of collaboration – not so much on a project by project basis, but as a central component of building sustainable working models for audiovisual archiving into the future.

Alan Burdette's paper on 'Collaboration and the EVIA Digital Archive project', broaches the issue head on. "Working with technologists, software developers, scholars, publishers, university administrators, lawyers, librarians, other institutions, vendors, editors, and other archives; the project is addressing the most fundamental concerns of archives as well as reaching towards new modes of archival action" (p6). He lists a range of benefits of collaboration and concludes that they help an archive's mission to preserve and make, let's face it, sometimes esoteric, information available to far-flung places, thus increasing usership: which is, of course, attractive to future funders.

On a similarly over-arching level Chris Clark's contribution on 'Scoping IASA's training brief for a changeable world' recommends the adoption of an open organisation design principle that focuses on fulfilling our mission WITH people rather than TO or FOR people. Such an open model, he argues, is necessary for our work to remain viable and relevant – and, indeed, for it to be sustainable.

There is that word again – 'sustainable'. Sustainability is an interesting word that is cropping up increasingly in a range of disciplines. It enters our discourse from the world of "sustainable development" as applied commonly to food production, urban development, forestry, business, energy and water supplies, etc. By searching for "integrated solutions" (cf. Lars-Christian Koch in this issue) and accepting collaboration as standard practice, we are perhaps edging towards a clearer understanding of what "sustainable audiovisual archiving" might look like.

Chris's paper links on another level. You will notice his title refers to a 'changeable' world rather than to a 'changing' world. This presupposes that the world has already changed from the more stable, closed model we've all been used to, but that it has changed to something that we should expect to continue changing. Robyn Holmes's article on Music Australia provides a perfect example of our need for adaptability in this changeable world in her word of warning about remaining sure-footed as collaborators come and go and circumstances beyond our control change. She delivers a mantra we might all do well to note: "be alert to strategic opportunities; catch these early; align goals with partners who can build capacity; exit if necessary; find alternative business solutions" (p26).

In short it becomes clear, reading the articles in this issue, that no single institution has the staff, facilities or funds to carry out the large-scale digitisation accepted as essential in the audiovisual archiving world today. Collaboration by outsourcing parts of the process is thus essential as both Lars-Christian Koch and Beth Robertson point out in their papers. Sometimes these collaborations seem obvious, such as the State Library of South Australia's arrangement to work with the National Film and Sound Archive to reformat nitrate film. Other's seem less so – such as their working with a "a local businessman with a lifelong interest in video

formats, who collects and maintains obsolete equipment" (p65) to assist in counting, identifying and visual inspection processes, processes that Koch sees as the first steps of any preservation programme. We all know these individuals with a "lifelong interest" and it would be nice to think that all our institutions might find ways to learn from their expertise as part of a fully open organisation design principle.

Thinking about collaboration with individuals, one large category of experts with whom it is essential we collaborate consists of the researchers who make the recordings we acquire. Alan Burdette's paper describes summer institutes during which researchers learn to annotate and document their collections – archives provide the systems and the training while the researchers provide the specific subject expertise. David Nathan, on the other hand, suggests that collaboration with these researchers should begin before the archival enterprise even begins. His quite substantial paper promotes the view that fieldworkers need to think of the purposes of making recordings well before they ever actually press the record button. (He talks about documentary linguistics, but my own research within the field of ethnomusicology leads me to suggest his arguments would pertain for most fields of study.) Without such prior consideration, Nathan observes that

> field recordings were poor in quality as a result of equipment choices (such as using inbuilt microphones of recorders), recording methodology (microphones far from speakers, or not aimed at the speaker), and an elicitation genre that might be useful for recovering lexical or grammatical information but otherwise containing limited content useful for teaching or attractive to listen to. (p50)

Drawing on lessons learnt in offering training to prospective recordists at the Hans Rausing Endangered Languages Project Archive (ELAR), Nathan hints at a time when field recordings acquired will be "made in order to be experienced by a human listener" and will have "metadata about the recording and the recording setting" to enable fuller interpretation. Advantages of such an approach feed through to research, respect afforded to the performers/community recorded, and through to our archiving mission.

It is 40 years ago this year that the International Association of Sound Archives (as it was at the time), first took on the mantle of the key international association for audio collections. IASA's first steps were made with the International Association of Music Libraries (IAML), from whom IASA came, and though IASA counts its existence from 1969 it was not until some years after this that IASA held its first solo conference in Vienna in 1988, 21 year's ago. So this year's conference in Athens will celebrate two important ages, officially 40 but 21 at heart, an appealing coalescence of significant numbers! It can only bode well for our organisation and our conference.

IASA has grown since those first days when Donald P. Leavitt (Library of Congress) was our inaugural president, and our understanding of the roles and responsibilities we must play in our professional life has matured in parallel. The notion that sound and sound archives was something much more broad than just music was probably the first step as we made our way from IAML, and the later recognition that audiovisual materials falls within our purview another; our pioneering work in digital archiving is our ongoing challenge. There is of course much more to this story, and the Athens conference will include a celebration of our birthday(s) and a paper tracing some of our important moments from Grace Koch.

IASA's history is something we have always been concerned with, and the History of IASA Committee (HIC), formed in 1983, was the first attempt at documenting our history. Since then, other initiatives have been established and there are more in the offing; history does repeat itself, apparently in writing its own history! However, though running the risk of repeating ourselves, one of the celebratory projects the IASA Executive Board would like to encourage is the recording of interviews with some of our key office bearers and early and founding members, starting with past presidents. We are an audiovisual archives association, so what more appropriate way to do this than to record oral history interviews (according to best archival practice of course). Rolf Schuursma wrote in the Phonographic Bulletin (no. 51/July 1988:p3) "There is still time to put the beginnings of IASA on record in the expectation that some day a historian will gather sources from the past and start writing the history of our Association." Twenty one years later there is less time than there was, but the opportunity is still there for us. I encourage all our members to think about how we might best do this.

As Athens followed Sydney with the Olympics, so with IASA, and this year's conference *Towards a new kind of archive? The digital philosophy in audiovisual archives*, comes ever closer, and the exciting array of events, papers, posters and panels planned for the conference are reifying into a very significant meeting. To be held at the Megaron Athens International Conference Centre, the conference website http://www.iasa2009.com/ describes the week's program, and I encourage you all to explore the opportunities offered and to register for this marvellous event.

At the British Library's Unlocking Audio 2 conference in March 2009 the new TC04 Guidelines in the Production and Preservation of Digital Audio Objects 2nd edition was launched. Copies are available from the IASA website and other suppliers, (http://www.iasa-web.org/). The event was a marvellous success and our thanks go to the British Library's sound archive staff who facilitated this for us.

The Co-ordinating Council for Audiovisual Archives Association (CCAAA) is a key umbrella organisation for IASA and the other Audiovisual Archives associations to coordinate our plans and programs, and to inform each other of our work. One of the projects of the CCAAA is World Day for Audiovisual Heritage, which was declared on the 27th October at the 33rd session of the General Conference of UNESCO. The CCAAA does not do this

itself, but relies on its members and the institutions and persons active in the field to take the initiative. This can be done as an appeal, an event of more or less significant dimensions, as commented screenings of moving images, seminars or broadcast programs, to give but a few examples. If you are planning an event, or would like to plan an event for the 27th October which could be counted under the banner of World Day for Audiovisual Heritage, please get in contact with us, and we will include this in the listing to bring awareness of it.

Another event the CCAAA coordinates is the Joint Technical Symposium JTS2010 is to be held in Oslo 3-5 May 2010, sometime near, I would imagine, the Norwegians hosting the Eurovision song contest! So there are two reasons to go to Oslo in May. Lars Gaustad, chair of the IASA Technical Committee, is the IASA representative on the JTS 2010 organising committee and the call for papers has just been announced.

The hard working team of the IASA Executive Board continues to work on your behalf, and we look forward to seeing you all in Athens at our Annual conference.

Kevin Bradley
Canberra, Australia
May 2009

Thinking Outside the Archive: Collaboration and the EVIA Digital Archive Project

Alan R. Burdette, Indiana University

Based on paper presented at the IASA International Conference, Sydney, Australia, September, 2008

Introduction: The necessity of collaboration to an archive

The landscape for sound and media archives has changed dramatically in the last decade. Digital audio preservation has moved from being a question, to the creation of best practices, to being an imperative. With several media formats from several different generations on the brink of deterioration or obsolescence in the next decade, digital preservation is a necessity that we cannot ignore. Indeed, even the most recent born-digital "media-free" recordings are also in grave danger, not so much because of format obsolescence but because of poor management by individual collectors. Video is in even greater danger than audio holdings due to the greater complexity of the playback technology and the higher degree of format obsolescence. No less than preservation concerns are the pressures for online access to collections and the accompanying challenges to do so legally, ethically, and in ways that are easy and attractive to users. Unfortunately, most media archives are under funded, understaffed, and dependent on grant funding for any kind of preservation or access initiatives. This is an exciting but turbulent time for media archivists as they retool for new technologies and new partnerships.

Collaboration is not new to archives. Filmmakers, scholars, publishers, record producers, commercial venders, and museums have all been collaborating with media archives for decades. However, the new paradigms of digital preservation and access have required collaborations on a scale and at a depth that is unprecedented. Indeed, preservation and access requires partnerships that stretch the boundaries of the conventional sound archive in ways that challenge some of the very notions of who we are.

The EVIA Digital Archive Project is an excellent example of broad collaborations that have been successful in addressing several key issues for the Archives of Traditional Music and for the field of ethnomusicology and related ethnographic disciplines. Working with technologists, software developers, scholars, publishers, university administrators, lawyers, librarians, other institutions, vendors, editors, and other archives; the project is addressing the most fundamental concerns of archives as well as reaching towards new modes of archival action.

Overview of the Project

The EVIA Digital Archive Project is a collaborative effort to establish a digital archive of ethnographic field video recordings and an infrastructure of tools and systems supporting scholars in the ethnographic disciplines. With a special focus on the fields of ethnomusicology, folklore, anthropology, and dance ethnology, the project has developed a set of tools for use by scholars, instructors, librarians, and archivists. In 2001, the project was funded by the Andrew W. Mellon Foundation, Indiana University, and the University of Michigan, and built through the collaboration of ethnomusicologists, archivists, librarians, technologists, and legal experts. The primary goal of the EVIA Project has been to preserve ethnographic field video created by scholars as part of their research. Its secondary goal has been to make those materials available online in conjunction with descriptive annotations. Project staff and contributors have created a support system and a suite of software tools for video annotation, online collection searching, controlled vocabulary and thesaurus maintenance, peer review,

and technical metadata collection. The project will reach the end of its funded implementation phase in June of 2009 and has begun to provide online access to the finished collections in the spring of 2009.

The EVIA project is unusual in that it was allied with the Archives of Traditional Music, but it was not primarily about preservation and access to existing ATM holdings. The impetus for the project came from its co-principal investigators Ruth Stone and Lester Monts and their recognition that they and many other scholars had significant video collections in their personal possession that had not been deposited into an institutional archive. Part of the project's mission has been to draw those collections into research archives.

Ruth Stone at Indiana University and Lester Monts at the University of Michigan are scholars of Liberian music and both were concerned about their own deteriorating collections of video recordings. They gained the attention of the Andrew W. Mellon Foundation which was also looking for a promising video project to support. With initial planning phase funding, in 2001-2002 they brought together a diverse group of experts for three intense planning sessions over the course of nine months. The results of these planning sessions established the framework for the project, its mission, and the collaborative principles that would be necessary for success. The planning sessions were tremendously productive but also challenging. Many different agendas were present and not everyone was in agreement.

Through the course of the year-long planning phase and then through several years of development, the EVIA Project has created an ambitious agenda to address a broad range of scholarly needs in ethnomusicology and related fields. These needs include infrastructure for digital video preservation and delivery, new models for scholarly communication and publication, and solutions for the technical and legal challenges required by the creation of an online publishing system for archival materials.

Preservation

The preservation of video recordings is at the core of the EVIA project mission. Video began to be adopted by scholars in the mid-1970s and widely employed by the late 1980s, because it offered an inexpensive way for researchers to capture a fuller range of expressive culture than still photography or audio recordings allowed. However, the deterioration of video signals on various carriers is dramatically fast compared to audio, as is the obsolescence of playback equipment. For example, because the Hi-8 format enjoyed less than ten years as a popular field recording format, and because it was not used in the professional broadcast industry, playback equipment has disappeared quickly and is now difficult to find. We have also seen a greater obsolescence of video recording formats compared to audio. Between 1990 and 2008, the formats of VHS, VHS-C, 8mm, Hi-8, and MiniDV were all popular with scholars as field recording. Today, MiniDV is the only one of these formats that is not considered obsolete as a field recording format, but it, too, will soon be left behind as the industry moves quickly towards tapeless recording solutions.

While audio archivists have come to broad consensus about digital audio preservation as described and proscribed in *IASA TC-04*, and in *Sound Directions, Best Practices for Audio Preservation*, the same has not yet been achieved for digital video preservation. Digital preservation of video within the EVIA Project and many large media archives has proceeded in the absence of broadly accepted best practices, but has used the model of audio preservation as well as a careful assessment of the best way forward in the absence of such guidelines. We have been careful to adhere to basic digital preservation principles in our formulation of a solution to long-term digital video preservation and have consulted with other digital

video preservation efforts around the world. Unfortunately, the disintegration of video recordings requires that we act now to make preservation transfers rather than wait until standards and best practices are adopted. One of the key areas of partnership in the EVIA project has been to utilize the facilities and the expertise of the Duderstadt Media Center at the University of Michigan for videotape transfers. All but the oldest and most unusual formats are digitized there and then sent to Indiana University for quality assurance. Formats such as ½" open-reel or U-matic have been sent to commercial vendors.

Access

The archival holdings of the EVIA Project are accessible online but are restricted to educational uses. Rather than making these holdings widely available, they are available through selected academic institutions, groups, or by individual permission. Most of the recordings in the EVIA Project were recorded under the condition that they only be used for research and educational purposes. We take the stewardship of these recordings seriously and so we carefully control access and require that users agree to a statement about how they may utilize the archive materials. The EVIA Digital Archive Project has endeavored from the very beginning to improve the ability of scholars to document their video recordings and to enable library-based searching of its content. Librarians have been a key part of the project design and we have incorporated standard MARC record cataloging as well as controlled vocabularies into the project implementation.

Scholarly Annotation and Publishing

At present, the EVIA Digital Archive consists of a group of video collections that have been selected by an editorial committee for inclusion in the project. The archive is designed to be a long-term preservation repository for these recordings as well as a unique peer-reviewed scholarly publication. In addition to the approximately 10 hours of video in each collection, scholars have worked extensively with their recordings to describe and analyze what they have documented. The content of the archive represents the culmination of preservation, annotation, and editorial work.

Annotation of video emerged from the beginning of our planning as a way to improve the quality of documentation the archive acquires with video recordings and the project has built tools to maximize the ability of a scholar to describe their video. This process is intended to help the scholar with their research and ultimately create a much richer resource for others. After working with our first group of scholars, we realized that we were also creating a new kind of digital publication and have since built additional software tools and administrative support for the peer review and publication process. Scholarly annotation of ten hours of video and the accompanying citations and glossary entries have regularly reached the equivalent of 80 pages of single-spaced text. By bringing to bear the conventional mechanisms of peer-reviewed publishing to video annotation, we are placing greater scholarly value on those annotations, and at the same time, transferring some of the typical academic rewards for peer-reviewed publishing to archival documentation.

Project Status

We presently have forty-five collections in different stages of completion as part of the archive. At the time of this writing, eight collections are ready for publication and will be made available as part of the first round of access to the EVIA Digital Archive. The small percentage of collections that are completed reflect the developmental nature of the project, and it is worth noting that projects that started in the more recent summer institutes have

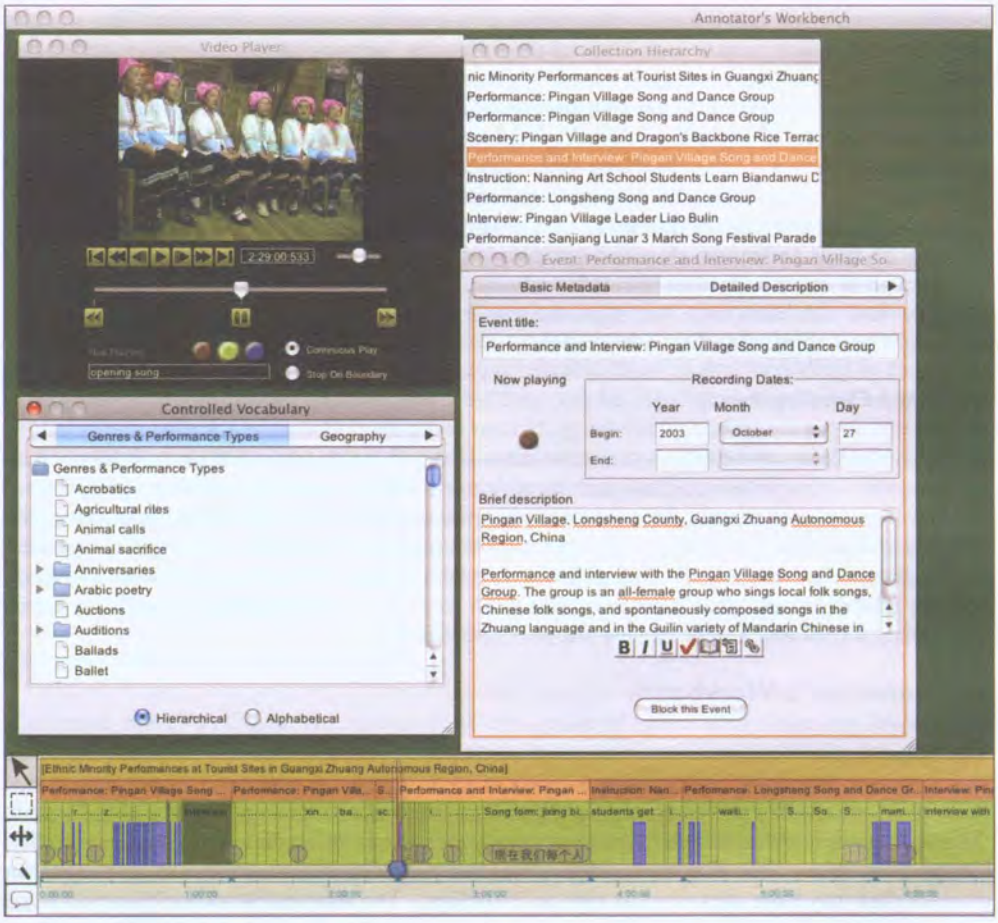
reached completion more quickly than those of the earlier summer institutes. This success rate has to do with greater reliability of the software, better training, clearer models, and more efficient administration of the summer institutes and the ensuing follow-up. Because the annotation process is extensive and time-consuming, we have held two-week long summer institutes during which we bring a group of a dozen scholars together to work on their video collection. These summer institutes have proven to be very effective for training scholars to use the tools and to enable them to get most of their collection prepared. However, no scholar has completed all of the work at the summer institute and they continue to work on their collection after the institute is complete. The summer institutes have not only proven to be an important means for scholars to focus intensely on the task of annotation, but they have also been excellent opportunities for scholarly dialog between a diverse group that might not come together otherwise.

Software Development

Software development has been the most extensive and most expensive part of the project. At the time we began production, satisfactory tools did not exist or were too proprietary for our archival concerns. Software development, which will ultimately all be available through an open source license, has been focused on the production of a video annotation application and an online search and browse tool. Additional applications have also been built to address needs that have emerged such as a controlled vocabulary and thesaurus maintenance tool and a peer review support application.

The Annotator's Workbench

The Annotator's Workbench enables users to create a collection from a set of existing video files, segment that collection at several levels, create annotations for those segments, assign controlled vocabulary terms to segments, and to control access to parts of the collection. The Annotator's Workbench is installed locally and reads video files that are also installed locally. The local video files are 1 Mbps (Megabit per second) transcodes of preservation masters that may have data rates as high as 270 Mbps. The Annotator's Workbench creates an output file that contains all of the metadata generated by the user in a METS-compliant .xml file. Once a project is complete, this file is archived with the preservation masters and is uploaded into our FEDORA repository for preservation and online delivery. Key features of the Annotator's Workbench include the ability to create a collection out of multiple files, segment that collection into intellectually meaningful units and layers, annotate those segments and layers with descriptive information and controlled vocabulary terms, create textual transcriptions and translations that are assigned to segments, and limit public access to segments within the collection if desired.



Caption: Screen capture showing several features of the Annotator's Workbench software developed by the EVIA Digital Archive Project.

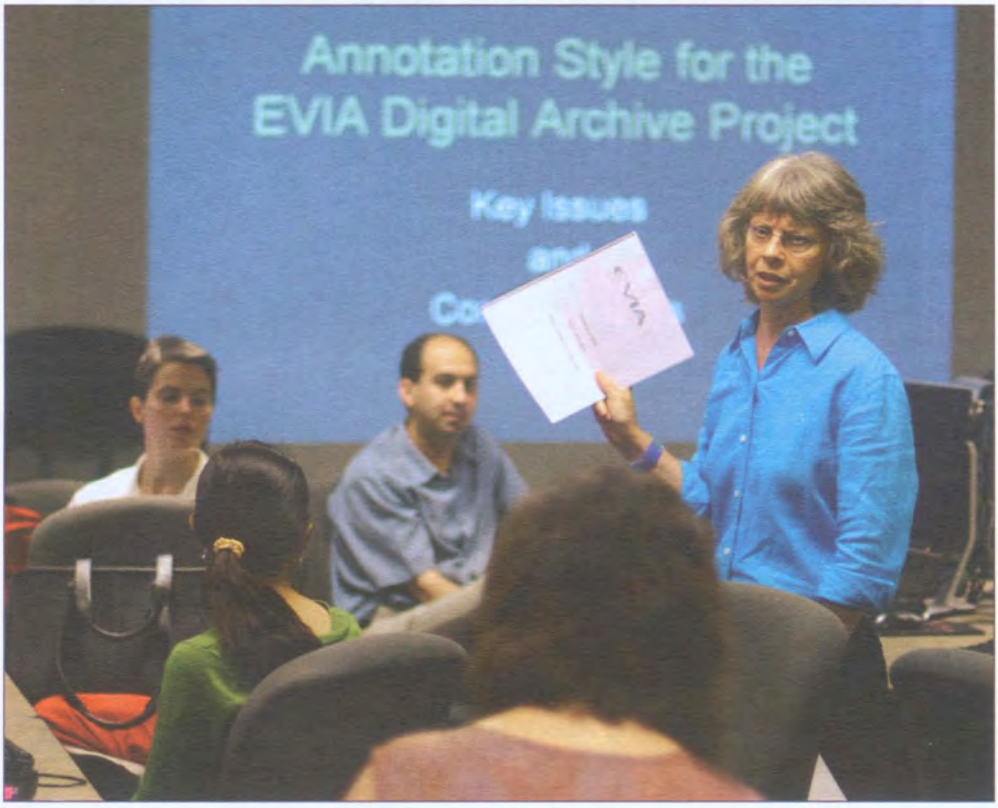
Online Search and Browse

Video collections created by the EVIA Project are accessed using our Online Search and Browse tool. This multi-functioned application allows users to search, browse, and access the video collections and multilayered metadata created by the scholar in the Annotator's Workbench. Full-text searching is available as well as browsing through assigned controlled vocabulary terms. Extensive playback controls, full-screen playback, and playlist creation are also available to the user. The multiple layers of annotation and transcriptions are all accessible through the interface.

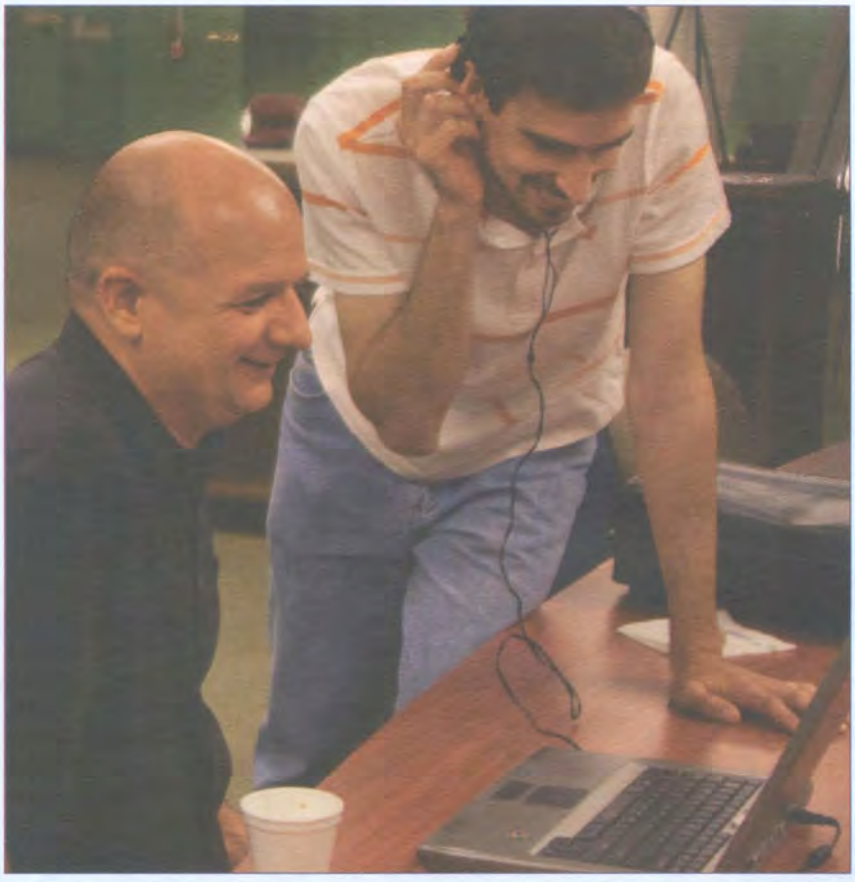
Controlled Vocabulary and Thesaurus Maintenance Tool

The Controlled Vocabulary and Thesaurus Maintenance Tool is designed specifically for librarians to create and manage controlled vocabularies and thesauri that will be used within the Annotator's Workbench application. The EVIA Project has designed its own controlled vocabulary categories, but the Annotator's Workbench has a modular design that allows

different controlled vocabulary schema to be used for different kinds of projects. This tool not only allows a librarian to maintain a list of controlled vocabulary terms and their authority references, but also enables the creation of different vocabulary sets and schema. During summer institutes and the period that follows, a librarian is in direct contact with the annotating scholars and negotiating the addition of controlled vocabulary terms to the existing lists.



Caption: EVIA Digital Archive Project assistant Colleen Haas gives a presentation on issues of annotation writing style during the 2008 summer institute at Indiana University.



Caption: Frank Gunderson and Alex Perullo compare video and annotations during the 2006 EVIA Digital Archive Project summer institute. Both Gunderson and Perullo are ethnomusicologists who have conducted research in Tanzania.

Sustainability

The EVIA Digital Archive Project is being sustained through collaboration with the Institute for Digital Arts and Humanities, the Digital Library Program, the Archives of Traditional Music, and the University Information Technology Services at Indiana University. In this way we have a base infrastructure from which we are applying for further grants to develop content, and are also using the EVIA architecture as a base platform from which to develop further functionality for scholarly media. For these sustainability efforts we are exploring collaborations with other institutions and projects.

From a preservation point of view, we are relying on the Archives of Traditional Music and the technology infrastructure at Indiana University for the long term viability of the files we are creating. As the Archives of Traditional Music generates digital preservation masters, we have become reliant on Indiana's Digital Library Program to maintain and migrate those files. At first glance it might seem as if the archive is ceding stewardship of those files to the Digital Library Program and the university because those files will no longer reside on

a server maintained by the Archives of Traditional Music. However, it is more accurate to view this situation as one in which the Archives and the Library have committed to long-term collaboration to manage these preservation masters, learning from each other about preservation and storage needs and requirements.

Collaboration

Within the EVIA Project, collaboration has occurred at multiple levels. More than just a case of two institutions pooling resources, we have created a collaborative framework that reaches out to many different units within our campuses as well as across many different institutions. A fundamental point is that a close collaboration with scholars has led the Archives of Traditional Music into greater technical collaborations as we work to support our mission principles. We haven't changed the mission of the archives in any radical way; rather we are better realizing our basic mission of preservation and access.

The EVIA project has been advanced during its development by institutional collaboration at several levels. At a basic level it has been a collaboration between Indiana University and the University of Michigan. Both institutions have provided significant resources in the way of personnel time, space, and expertise. The Mellon Foundation, of course, has also been a significant partner. They have not only invested significant funds into the project, but have also provided extremely important guidance to the project. The idea to hold a summer institute, for example, came from our Mellon program officer. The Mellon Foundation has also consistently pushed for solutions to long-term sustainability of the project. Another kind of institutional collaboration is emerging as we discuss with other archives ways in which we can share resources. In particular, archives that have good digital preservation copies, but lack an online access system are excellent partners with the EVIA project because collaboration is mutually beneficial to both.

Archives work with scholars all of the time, but primarily in one-way exchanges. Either archives serve scholars by providing them with materials they need for their research, or archives accept the collections of scholars for deposit. Scholars often describe their media items based on their own idiosyncratic systems and archives must translate these systems (if they indeed exist) into some archival standard. The depth of this kind of documentation is highly variable and often takes place long after the items were created. The EVIA project has endeavored to create tools and procedures for the documentation of video that supports the work of scholars during their research while simultaneously preparing them for archival deposit. We achieve this by using a METS/MODS compatible schema behind the various descriptive metadata areas that scholars utilize.

The EVIA project has been developed by multiple units across the campuses of both Indiana University and the University of Michigan. From a planning and development perspective, the project has depended upon the advice and regular feedback from scholars in the Ethnomusicology programs at both institutions. In the case of Indiana University it has involved nearly all of their faculty and several graduate students in the department. In this sense, the department has invested itself in the success and development of the project.

Indiana University's Digital Library Program has been key to keeping the project development aligned with library standards and the ever-developing cyber-infrastructure of the university. By insuring that project development uses the same technologies of other library projects they enable sharing of code and functionalities across several projects at Indiana University. This helps the software developed by EVIA take advantage of related software development for other projects, and EVIA technology can also be more readily integrated into other projects.

Without the infrastructure and technology expertise provided by Indiana's Digital Media Network Services (DMNS) and the University Information Technology Services (UITS), the EVIA project would not have been possible or at least affordable. UITS is the centralized Information Technology service for the entire campus and DMNS is a sub-unit within UITS that provides network and streaming media support. UITS provides the Mass Data Storage System (MDSS), a data tape robot with a current capacity of 2.2 petabytes. The EVIA project uses MDSS for long-term storage and it will be the backbone of the preservation repository service of the Digital Library Program that will be implemented by the end of 2009. We could not have seriously considered the EVIA project without these key resources and without the support of UITS. By the same token, the EVIA project has been an important part of broader arguments at Indiana University for high capacity digital storage for the humanities and EVIA has also been a strong part of the rationale for preservation repository services. As much as we have needed the infrastructure provided by our universities, we have in turn helped justify a variety of technology infrastructure agendas.

In 2008, the EVIA project became officially affiliated with Indiana's new Institute for Digital Arts and Humanities (IDAH). By doing so, administrators and software developers employed by IDAH will maintain the basic functions of the EVIA project with seeking out and developing new sources of funding and collaboration for growth of the EVIA project. As the same time, the EVIA project provided some of the framework and models for IDAH and many of the experiences gained while administering the EVIA project were critical to informing how IDAH needed to be managed. One of the persistent difficulties on the EVIA project and any other digital project that relies on software developers hired by grant funds is the fact that good programmers are hard to find and hard to keep on soft money. As the end of any grant term nears, it is very common for programmers to look for new employment in order to insure that they won't be caught without a job if grant funding ends. For the EVIA project and many others like it, this has meant that project administrators spent a great deal of time hiring and training new employees and it has resulted in a lot of down-time on the project. The EVIA project has helped build a new model within IDAH where a stable of programmers are guaranteed a regular contract, but their time will be assigned to various grant projects or internal projects as needs arise.

Although the EVIA project began with a group of ethnomusicologists, they recognized in the planning phase that ethnomusicology was not a discipline that was large enough to sustain this work by itself. Thus, the project has worked to involve scholars from other related ethnographic disciplines such as anthropology, folklore, ethnochoreology, and various area studies. The long-term effect will be to broaden the base of users and create an interdisciplinary community that will better support the further development of the project.

The EVIA Project has actively sought collaboration with other projects that have preservation and/or access needs for video collections. In some cases EVIA has provided a ready-made preservation and access system for a video collection. The Archive of Historical and Ethnographic Yiddish Memory (AHEYM) project is working with the Archives of Traditional Music and the EVIA project to provide these preservation and access services. Nearly 700 hours of video from AHEYM will be available through the EVIA online collections but it will also be available through a special AHEYM portal they will create based on the EVIA Project architecture. In a related case, the EVIA project will be collaborating with the team from the Cheyenne Sacred Language project to provide similar preservation and access services to their project which is using video to document an endangered language. The EVIA project has also been collaborating with the Central American and Mexican Video Archive (CAMVA) project for two years in a mutually beneficial arrangement that has supported additional software development for the EVIA project while providing annotation and cataloging

software technical support as well as a customized access interface for the collaborating institutions in the CAMVA Project. Several other collaborations are in discussion and development, and we see this as an important way to expand content and continue software development.

The EVIA project sees many possibilities in the area of collaboration with the subjects and communities documented in the video recordings. In one case a scholar brought one of her video subjects to a summer institute to discuss the recordings and translations. In other cases, scholars have been working in the field to annotate and discuss their descriptions with the people they are documenting. We are very excited about the possibilities for integrating the research, publication, and archiving process more closely together. This kind of collaboration facilitates better documentation and finer control of access and permissions and is ultimately better for the field and better for the communities we study. It also has the potential to remove more of the ambiguity regarding access that plagues many ethnographic collections.

Collaboration Benefits

At a fundamental level, collaboration requires the members of an organization to confront the different ideas, workflows, and priorities of another organization and its culture. In the case of a good collaborative partner, one can be pulled forward by this confrontation and re-evaluate one's own status quo. Even when there is disagreement, the evaluation that precedes it is extremely helpful in defining one's perspective and practice in contrast. When there is agreement, those strengths can be shared and advanced in a more confident way. Ultimately larger best practices can be built this way.

In the eight years since the project began, the university has created a significant amount of bureaucracy to address financial accountability relative to grant management. However, from the point of view of the products of grant funded digital projects in the humanities, it is fairly easy to think of projects we have seen where the results were minimal and never fully realized or publically distributed. Despite whatever reports and accounting the funding agency requires, single institution projects do not experience the kind of accountability that is naturally built into a collaborative project. Working together with another organization puts one's credibility on the line and the friendly competition is useful for pushing the goals of the project forward.

One of the unexpected benefits of collaboration within the EVIA Project has been between scholars themselves. Scholarly activity within the humanities still tends to be a very solitary endeavor and it is rare for scholars to engage in extended dialogs with their colleagues that result in tangible products. The tools and procedures of the EVIA project are the result of many years of back and forth dialog with scholars about fundamental issues of ethics, the uses of video, and digital publishing. The creation of a controlled vocabulary schema required an extended discussion among a group of scholars that caused them to analyze and think through their own assumptions about disciplinary categories. In many ways we have only scratched the surface of scholarly collaboration and anticipate that as the project broadens its disciplinary horizons, we will see more interdisciplinary questions and collaborations arise.

Archives often have difficulty justifying their existence relative to their costs and the amount of use they actually see. Through the EVIA project, the Archives of Traditional Music has helped make a case for special collections generally speaking and has moved the institution forward in very useful ways. By thinking broadly and consistently making the arguments for

how the development of preservation and access services serve the entire university, archives demonstrate their value to their larger institution. The preservation of video or audio follows the same principles regardless of the content, and while surface features of access may be different, the underlying technologies of delivery are fundamentally similar.

Collaboration Challenges

Good communication is essential to effective collaborations and it is where most collaborative difficulties lie. We have certainly struggled within the EVIA project to keep all of the stakeholders apprised of what was going on. With distance, face-to-face meetings become difficult, time-consuming, and expensive. Even with easy access to all manner of electronic communication, face-to-face meetings are extremely valuable to building effective collaboration and to keeping it alive. Projects or aspects of a project can run off the rails very easily if not attended to with regular communication.

Archives thrive on careful controls, but collaboration inevitably involves compromise and by extension some loss of control. If a collaboration is set up carefully, then a project can gain from a partner who is better at controlling that aspect of the project. However significant problems can arise when an archive cedes key aspects of its mission and its reputation to an organization that is not better at controlling its aspect of the project. This is a recipe for frustration on all sides of the collaboration and this is why collaborative partners must be chosen carefully.

One of the most important challenges to collaboration is the continual evaluation and demonstration of how a given collaboration is mutually beneficial to the parties involved. Collaboration breaks down when partners no longer see its benefit and do not invest the energy in its success. The partners need to strike a balance between selfishness and selflessness and be open-minded about the give and take that is necessary.

Conclusion

Archives are places that hold treasures of enduring value, and the preservation of these holdings and the collective access to them benefits many. Ultimately, archives will be judged by what benefits they are providing to the public, but many of us struggle with the fact that the users of ethnographic media archives are often dispersed and esoteric in their interests. We preserve and protect those things that only a few find valuable now, recognizing that they will be invaluable to some in the future. The more successful we are at finding allies in many corners, the more successful we will be in our more basic mission of preservation. At present, digital preservation demands collaboration for all but the largest archives. Beyond the technological and economic necessity for collaboration, however, is a further challenge to work with a broader base of scholars, publishers, librarians, technologists, and users so that we will be better prepared to sustain our collections into the future. In so doing, we make them more invaluable and more present in the lives of many. We can no longer afford to perpetuate the perception of archives as a container to put things in, but must see what we do as a kind of public action that is integral to the broader mission of other institutions and to the everyday work of our constituents.

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Music Australia: Building innovative partnerships for online access to music made, played and recorded in Australia

Robyn Holmes, Curator of Music, National Library of Australia, and Kaye McIntyre, Manager of Music Australia, National Library of Australia.
Paper presented at IASA conference, September 18, 2008, Sydney, Australia

This paper examines some of the strategies used by the National Library of Australia to build a collaborative music service on a national scale, and in particular the challenges faced in building online audio content. It demonstrates the opportunities that a government-business partnership provides to break through some of the existing barriers in providing access to resources. And it reflects upon the volatility in the music industry that creates ongoing challenges for archiving, resource discovery, online access to and delivery of musical sound.

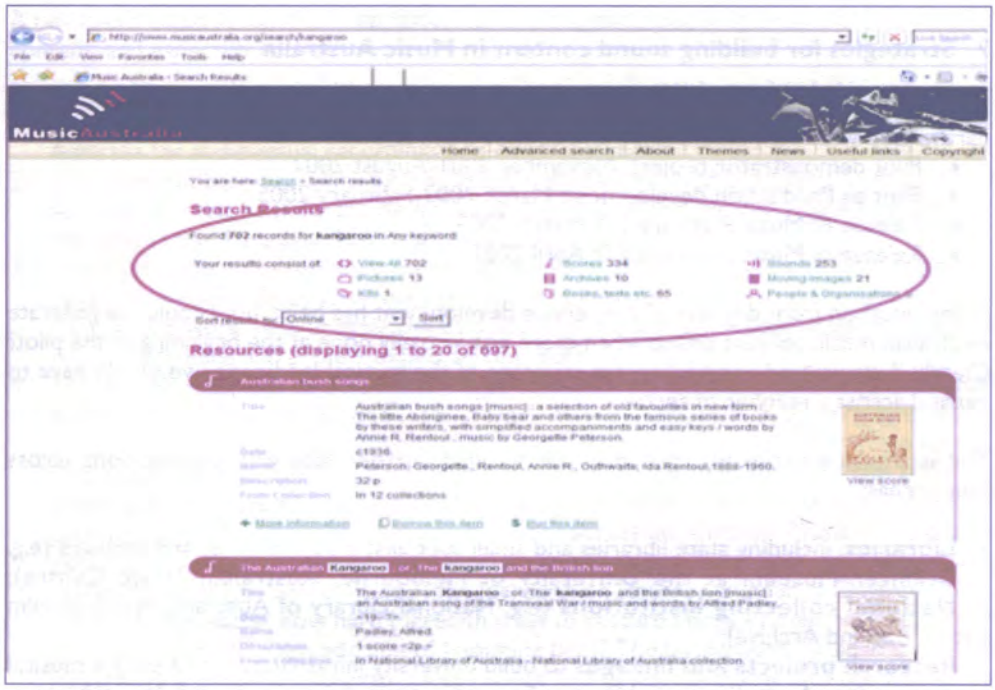
1. What is Music Australia and how does it work?

Music Australia is a free resource discovery service to Australian music, hosted by the National Library of Australia and representing more than 50 cultural organisations around the nation. The service crosses the boundaries of formats, and institutions, to present a comprehensive showcase of Australian musical culture from the earliest published music to the latest recorded hit. This includes all types, styles and genres of Australian music, information and research about Australian music – whether created, performed or published in Australia or by Australians, or associated with Australia. In this way, Music Australia creates and displays to the user a 'virtual' national music collection.

We harvest and upload metadata from multiple institutions into the Australian National Bibligraphic Database (ANBD), from which the Music Australia resources database is derived. Music Australia stores and displays the bibliographic records, but the contributing organisation holds and delivers the resource. If a resource is available online, people can view, listen, download, or print. If an object is not in digital form or online, the user is guided from the bibliographic record to where they can locate or 'get a copy', whether by borrowing through an institution or buying from an institutional copying service or commercial supplier. To be sustainable, Music Australia is automated as much as possible so organisations can contribute to the service largely from within their existing staffing, resources and programs.

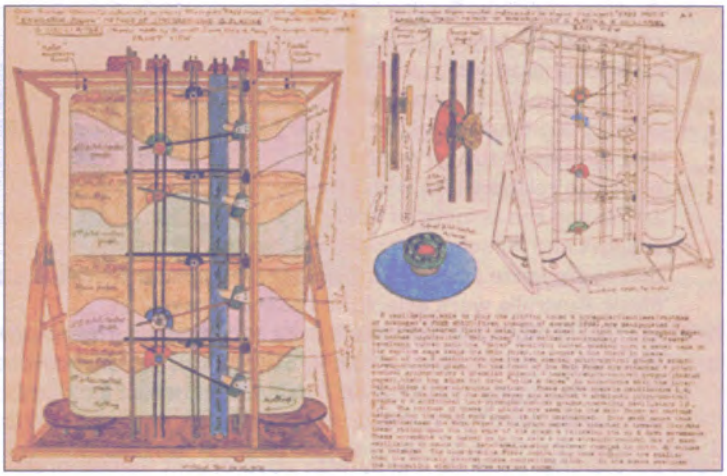
Most importantly, the service is not a single format site akin to the growing number of commercial digital download music or sheet music sites. From the beginning we wanted to ensure that music was represented in its inherent complexity as a symbolic and performed artform documented in multiple formats and contextualised as part of an historical continuum in Australian cultural life. We wanted to provide a music subject-based view displaying the range of resources together with information relating to musical works, composers, performers and organisations. All this is delivered seamlessly through a single point of access.

A simple search from the home page using the term 'kangaroo' will suffice to demonstrate the wide range of formats, functionality, institutions and resources – from heritage to contemporary.



The search returns a wonderful mixture of music material associated with the term 'kangaroo', including sheet music from Paris in the 1800s, recordings of indigenous dances and children's songs, through to orchestral suites and football anthems. Formats include pictures, scores, manuscript collections, books, sound recordings, moving image, archived websites, educational kits, as well as biographical information pertaining to people and organisations.

The search even reveals an original manuscript drawing of Percy Grainger's 'free music' - a Kangaroo pouch method of playing and synchronising 8 oscillators – held at the Grainger Collection in the University of Melbourne.



2. Strategies for building sound content in Music Australia

Music Australia has been developed in four stages, the first two stages in management partnership with the National Film and Sound Archive.

- Pilot demonstrator project: November 2001-August 2002
- Pilot to Production development: March 2003-February 2005
- Release of Music Australia 1.0: March 2005
- Release of Music Australia 2.0: April 2007

A key question from day one of the service development has been: how could we generate Australian music content online when there was virtually none at the beginning of the pilot? Clearly if we wanted comprehensive coverage of the musical landscape, we would have to expand across a number of sectors.

The approach we took was systematically to build ***partnerships*** with organisations across four arenas:

1. **Libraries**, including state libraries and small specialist music libraries and archives (e.g. Grainger Museum at the University of Melbourne, Australian Music Centre);
2. **National collecting institutions** (e.g. National Library of Australia, National Film and Sound Archive);
3. **Research projects and linkages** to build university infrastructure and unique musical content (e.g. Australian Sound Design, Sound Footings, Australian Jewish Music Archive, National Recording Project for Indigenous Performance in Australia);
4. **Arts projects and arts funded organisations** (e.g. Australian Music Online, funded by the Australia Council for the Arts).

The ***key principles and strategies*** we used through these partnerships to build content were to:

- develop guidelines for digitisation of scores and sound and coordinate content selection cooperatively across different organisations;
- assist organisations to identify unique Australian resources and catalogue and upload these to the Australian National Bibliographic Database (ANDB);
- develop a methodology for harvesting, mapping and converting disparate types of data into a central national database of MARC records (the ANBD);
- prioritise relationships with agencies or projects that could manage relationships with artists and the associated contractual issues and rights obligations;
- support and influence initiatives or projects from the early stages of development so that appropriate architecture, linkages, protocols and permissions for delivery through Music Australia were established at the outset;
- alert an 'unknowing' community of creators, performers, producers, publishers and audiences to the Library's role in building this national corpus and service online;
- identify Australian web sites with rich music content for distributed archiving by different institutions into PANDORA, Australia's web archive.

Such partnership building, mainly with government funded organisations, has dramatically increased the representation of music in the ANBD and Music Australia since the first stages of its development. Nevertheless, it would be fair to say that, despite these very significant initiatives, the desired flow-on effect of generating digitised or capturing born-digital Australian music content and making this accessible to users online continued to remain small in quantity and limited in scope.

A few issues acted as significant ***inhibitors*** to creating and sustaining access to online music content, and especially sound:

1. The problems associated with archiving and making accessible born digital objects anddeep web content. This is made more difficult without national legal deposit legislation in Australia for audio-visual recordings and electronic media.
2. The copyright barriers, which have inhibited online access to the legacy content of major national projects such as the *Anthology of Australian Music on Disc* which had been an initiative of the Australian National University.
3. The legacy and sustainability issues that remain with one-off research or arts grants, funded competitively by external agencies of government through peer review. Who archives the work, who updates the data and who sustains the access to source material when the funding and project expertise runs out?
4. The lack of systems in institutions for large-scale delivery of sound recordings and other media. This has meant that the leading work of sound archives in digital preservation and storage has not as yet systematically flowed through to delivery and online access. The great news for the National Library has been the recent launch of the Library's audio delivery system. The first of the Library's substantial oral history and folklore archival recordings related to music are now accessible through Music Australia. A delightful example is 90 year old Harry Bormann, born 1901, and interviewed and recorded in 1991 by field collector John Meredith on Harry's verandah in Claypans South Australia. No matter how hard Meredith tried to capture Harry's tunes, his dog insisted on singing along to a soundscape of humming bees! The background detail in such field recordings is often as important as the songs and tunes, a window into the world and life of the singer.

You can listen to this item directly in Music Australia or retrieve the item using the permalink http://nla.gov.au/nla.oh-vn2205214 This will take you first to a Licence Agreement covering conditions of access and terms of use and then to an mp3 for listening or downloading.

If there is a timed summary or full transcript of the recording, the sound is matched automatically to the text, thus enabling the user to search for exact moments in which songs or tunes may be embedded and contextualised within lengthy interviews. Subject to permissions, a Music Australia user can also order an archival or broadcasting quality copy via the National Library's *Copies Direct* service simply by selecting the "Want to Buy" option from the record.

3. Music Australia 2.0 and a government-business partnership

By the end of December 2005, the first year of the production service, the MA resources database included more than 153,179 bibliographic records. Of these only 11,211 musical

resources were fully available online or had an online component. Most notably, of the almost 37,983 Australian sound recordings catalogued in Australian institutions, only 557 (1.4%) were available as online sound. By comparison almost 10% of Australian music scores were available in digitised or digital form, largely due to the extensive program by the National Library to digitise and deliver Australian sheet music and to cooperatively kick-start printed music digitisation in the six State libraries.

Moreover, most strikingly, approximately 80% of the online content in Music Australia was out of copyright in the public domain. The service was thus seriously skewed to heritage music and perceived by users to represent primarily an historical not a contemporary corpus, even though the vast majority of the bibliographic records were for music post-1930. In the meantime, the quantity of music being offered online in the marketplace either by artists, publishers or distributors was suddenly beginning to grow. When we started building Music Australia, there was almost no Australian music online. By 2006, and before iTunes was available to Australians, a few online retailers had begun to emerge, the mobile phone companies were moving into the music business, individual music web sites were spawning, file sharing was rife, and social networking around music spaces was gearing up. We therefore started to consider the vexed issue of how we might grapple with music that was disseminated in the democracy of the web, well outside of the institutional spaces and collecting processes we occupied. We began to think more widely about engaging directly the Australian music industry.

An opportunity presented itself in 2006 in the form of an Australian music aggregator, destra Music, at that time a small company that had begun its life as a wholly Australian owned and focussed digital music business. It was actively aggregating Australian music from publishers and streaming to radio, and had also initiated <mp3.com.au> as a free-to-air 'deposit your music' site for emerging Australian artists.

What was particular about destra that made it stand out as a potential industry partner?

- Destra had been an early entrant into the digital music business and management of online rights in Australia.
- They had created rich data for their digital music, with descriptive fields of data at album and track level that could be exported and mapped to MARC records for inclusion in Music Australia.
- They were willing to generate for Music Australia an 'Australian' subset from their global database, including artist information.
- They were prepared to share the intellectual property in their data via Music Australia so other libraries and archives could access it.
- They offered support for the delivery of WMA (with Digital Rights Management) with 30 second clips and cover art, and were moving towards the delivery of mp3 formats (without DRM) in line with a shift in the music industry. (They also hosted a free download/networking site www.mp3.com.au for unsigned and independent artists, which we were discussing as a possible future content source).
- They were able to host a back-end e-commerce service for Music Australia, which would assist our users to move seamlessly from sampling to downloading full tracks and albums online.

What benefits did destra Music foresee in participating in a national, but non-commercial, service?

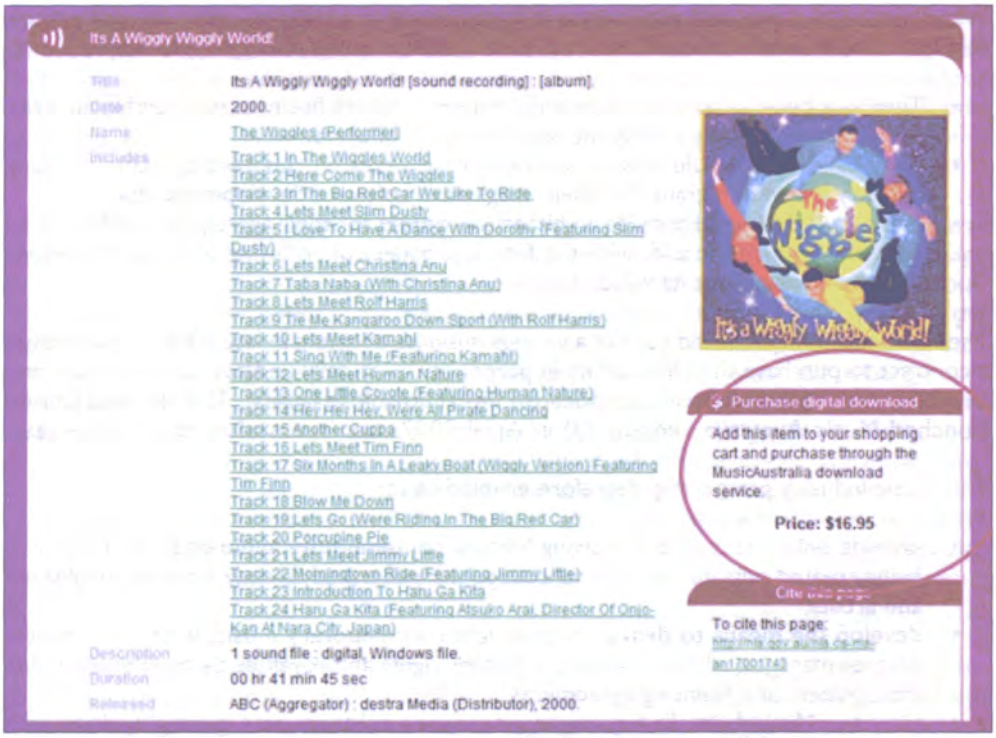
- They saw benefits to their marketing in a government-business partnership, and the potential for reaching a different type and range of users.
- They believed it would help to leverage other research and development, including industry innovation grants for their imaginative software development ideas.
- Music Australia could provide an historical context for their aggregation of Australian contemporary music and, with the future prospect of archiving their work, a sense of permanency about its value.

The National Library decided to take a serious business decision: in late 2006 we negotiated a contract to purchase the Destra data in perpetuity, with daily updates for two years, and to reengineer the service to accommodate a digital download facility. The National Library launched Music Australia version 2.0 in April 2007, two years after the first release.

This music industry partnership therefore enabled us to:

- provide online access to a growing 'virtual' contemporary audio collection that was being created outside institutional collections, generated directly from the publishers and artists;
- develop the means to deliver in-copyright contemporary music, with our industry partner managing all the artist and publisher rights and royalties through digital rights management and licensing agreements;
- provide a Music Australia e-commerce service to enhance users 'getting' options, with the industry partner managing the commercial download transactions;
- aggregate more artist information about contemporary music, often unavailable in traditional sources;
- move towards a new collecting and access model, to ensure we could capture both a permanent bibliographic record of Australian 'hot off the press' music as well as conceive a future mechanism for direct contributions to the service by artists, creators, publishers and distributors;
- enable the user to navigate between track and album level bibliographic records, as well as people and organisation records, a level of granularity that had not previously been possible.

The brief example on the next page, an album of children's songs released by internationally recognised Australian group *The Wiggles* in 2000, shows this relationship. Each track within the album is listed and can be searched from this record, as can the performers. By choosing the Purchase Digital Download option users were also able to purchase either selected tracks or the whole album through the e-commerce service, powered and managed by destra but branded as Music Australia downloads.



The success of this partnership with business has been measurable both through the increased number of online music resources and the usage.

Immediately before the launch of the new Music Australia version 2.0 there were:

- 167,656 resources
- 13,080 online resources
- 4392 people and organisation records.

With the release of MA 2.0, April 2007, with Destra content[1], there were:

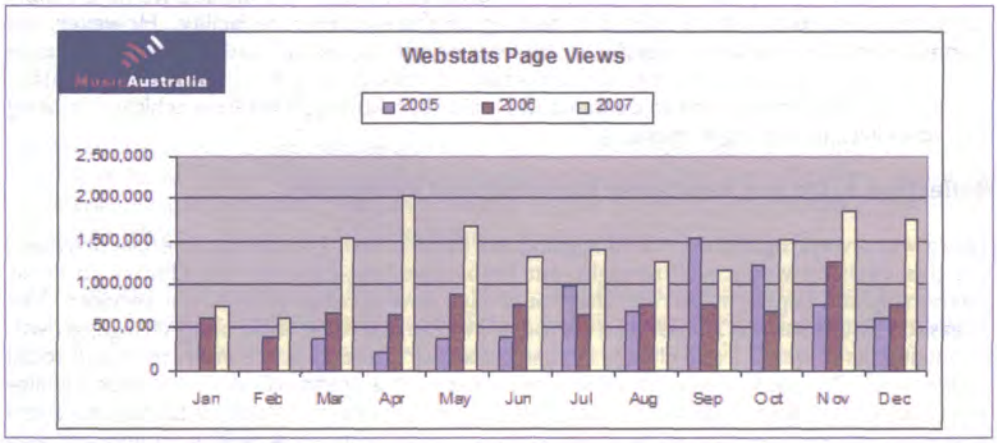
- 211,889 resources — an increase of 26.3% (44,233)
- 55,954 online resources — an increase of 327% (42,874), mostly representing an increase in online sound
- 4798 people and organisation records — an increase of 9.2% (406 records).

Additionally, the number of requests from artists and other suppliers to participate in Music Australia has encouraged us to consider the deposit of music from independent artists and multiple suppliers. The most frequently asked questions that now come to Music Australia are "Why am I not represented in Music Australia?" and "How can I contribute?"

Similarly, relaunching Music Australia with the new content, facility and interface immediately increased usage. The surge in usage from late March to May 2007, after the official launch on April 6, is striking.

[1] By August 2008 this had grown to 233,724, with 49,441 records contributed by Destra with sound sample and cover art and a digital download facility

Overview of Usage according to page views from release March 2005 to end 2007.



4. Recent events: termination of contract by business partner and its implications for Music Australia

This paper, however, has an unfortunate coda. Earlier in 2007, the parent company destra Media, which had rapidly expanded and diversified its business enterprise since the period when we negotiated our contract, was taken over by the media entertainment group Prime. A business review led to Prime closing the door on the 'destra Music' arm of the business, and to this end destra terminated its contract with the Library at the end of October 2008[2].

What reflections might we offer about this?

Reflection 1 – Do not give up though mitigate risk against external factors and exit if necessary.

The current volatility in the music industry and financial markets means that we are challenged by factors operating globally over which we have no control.

- Australian music is just as subject to global issues and trends as elsewhere, with the market dominated by the four transnational majors (about 70-75% of sales) and by iTunes at c. 90%. The implications for finding an aggregator able and willing to create an Australian sub-set of recorded music that includes all the Australian independents and small music producers remains problematic.
- Business models are in transition. The shift away from delivering downloads in WMA files with embedded DRM towards ubiquitous mp3 format is developing pace, partly in response to poor uptake by people frustrated with the limitations upon downloading. Australia's small music distribution agencies are engineering new web services models towards this end. For Music Australia, this is a wait and watch game.
- The battleground over file sharing, piracy, legal downloads and online licensing is rife, and is indicative of the turbulent industry environment. As well, there is a strong push in the creative industries and new music towards creative commons licensing, in direct opposition to the recording industry's position.

2 Since the presentation of this paper, the parent company destra Media has gone into receivership and its web presence has ceased to exist. The National Library has retained the Australian music data that it purchased and continues to present the records online but is unable to provide users with access to the full online content.

No-one in the Australian music industry is prepared to foretell the shape of the sector here in the short or even in the mid-term. While the Library is still determining the way forward about the immediate problems posed by the terminated industry contract, we have simply had to exit one part of the business by turning off the e-commerce facility. However, the e-commerce, not entirely successful, is the least of our concerns. Rather, our key focus is to work out an ongoing strategy for harvesting contemporary Australian music content directly into the service[3], and to continue the major breakthrough we have achieved in being able to deliver in-copyright music.

Reflection 2. Do not back away from risk and innovation!

There was always significant risk in aligning the service with a single commercial provider, but this decision was a well thought out innovative test-case for the Library to cross partnership and copyright barriers that could have flow-on effects for all our services. We released Music Australia 2.0 during a period of intense and rapid technology change, growth of online music, web 2.0 and change in user behaviour towards active interaction and social networking. But could we realistically expect that such a world will slow down or stabilise any time soon to give us time to catch up? Institutions like the National Library have had to learn in this environment to be more nimble, flexible, responsive, willing to innovate, able to discard or modify ideas and processes if they prove unworkable or as the patterns of use or the technology changes. We are currently working towards bringing all our web discovery services like Music Australia together under a single architecture, precisely so we can implement changes to our services more quickly and efficiently.

Reflection 3. Think ahead!

Sustain the vision and imagine the future but take small steps along the way.

Our vision for Music Australia includes:

- Multiple suppliers and aggregators for music content, including the capacity for individuals to contribute music and update information (Note: user capacity for tagging, correcting and updating is already implemented in the Library's new digitised Newspaper Beta service[4] and has been remarkably successful).
- Collecting and harvesting directly from the supply chain, and archiving with a flow-through to end-user access both from institutional repositories and via national discovery services.
- Access to full content music resources, using various technologies including e-commerce. The aim is to ensure that users can seamlessly get online the music they discover, while allowing for multiple commercial options.
- Use rights management, licensing solutions and authentication processes to facilitate delivery of in-copyright material to the public, especially as the 'long tail' becomes even longer.

This industry partnership setback in Music Australia has required us to pause, find an interim solution while larger-scale shifts take place in the marketplace, and continue our quest to break through barriers to access.

Our message remains: be alert to strategic opportunities; catch these early; align goals with partners who can build capacity; exit if necessary; find alternative business solutions. So, watch the Music Australia space www.musicaustralia.org for the next variation on a theme!

3 In 2007, a total of 104,082 tracks were released on the Australian market. Of these 17,434, that is 16.8%, were Australian (i.e. Australian artists, Australian recording).

4 Historic Australian Newspapers, 1803 to 1954 http://ndpbeta.nla.gov.au/ndp/del/home

Scoping IASA's training brief for a changeable world

Chris Clark, Head of Documentation and Selection, British Library

(This is an expanded and updated version of the talk given at the Multi.co.m workshop, September 23rd 2008 in Rome, entitled *Creating and managing digital resources: leadership issues arising from recent British Library initiatives*)

IASA's contributions to the training and development of audiovisual professionals have been impressive. Its various publications and guidelines have been adopted over the years, expanded, cited, consolidated and refined by other bodies, such as UNESCO, MEMORIAV, the British Library's technical internships and the online course devised by Multi.co.m.

It was for the final meeting of Multi.co.m that I was invited to Rome last year by former IASA Vice President Maria Carla Cavagnis Sotgiu to talk, from a British Library perspective, about training needs in relation to the work that I had been involved in with the Archival Sound Recordings project and, to a lesser extent, with the early planning stages for a Digital Research Centre, which will be placing digitised sound and moving image among the central components of its content offering. These projects have involved and will continue to involve significant change. Coping with such change, which amounts to cultural rather than incremental adjustments, requires capable leadership and my thoughts while writing my talk were guided by challenges to leadership, as I have perceived them to be, rather than notions of best practice or core competencies that have been the focus for IASA hitherto. The aim of this paper is therefore to serve as a companion measure to training initiatives that are already underway in IASA since the Sydney conference, to help identify existing strengths and weaknesses and to consider some of the lessons learned from recent experience.

I began my presentation in Rome with a typical story from today's museums and archives community. Around the middle of 2008 CNN reported on the Smithsonian's ambitious programme of digitization:

"The Smithsonian will digitize its museum collections (137 million objects) to make them viewable online"

"I worry about museums becoming less relevant to society", new chief says

"Officials don't know how long it will take to digitize the 137 million-object collection"

Nor, most likely, did the Smithsonian know for certain if such momentous effort and expense would ensure its future relevance. Similar statements even five or ten years ago, typically in relation to cataloguing and preservation targets, would have appeared without the attendant uncertainties. In a developed world dominated by expanding industrial output, the annual tally of catalogue entries produced and items preserved were in themselves indicators of relevance and training programmes would be in place to ensure that appropriate standards were applied and upheld to keep the numbers up. This world - its culture, its research communities, its designs based on industrial/military precedents - has moved on.

We can illustrate the change as an opposition between closed and open organizations.

Libraries v 'Here comes everybody'

CLOSED MODEL ORGANIZATION		OPEN MODEL NON-ORGANIZATION
Supports HERITAGE	STOPS →	Supports CREATIVITY
Special people		Social sharing & exchange
In special places		Community products (mountain bikes, Rap)
Think up special ideas	← THREATENS	Wikipedia, Linux, P2P
To deliver to passive users.		Tools: Web tools, open source, ©creative commons
Tools: patents, ®, closed systems		

This opposition of new and old world orders draws on similar ideas and diagrams presented by Charlie Leadbeater (e.g. at TED), Clay Shirky's book *Here comes everybody: the power of organizing without organizations* and presentations about the future of content by media futurist Gerd Leonhard. In the familiar organizational model we talk about safeguarding 'heritage' (*la patrimoine*) and providing expert services TO users. Specially trained people are hired and trained further to work in specially appointed places where they think up special ideas for delivering information to users who are perceived as passive readers and listeners, who are themselves conditioned to interact with organizational policy accordingly. Systems operated by such organizations are typically closed, their services and tools designed around physical copies (of sound recordings, books, journals, etc.) that are protected by rules, rights and patents. This model both prevents and is threatened by the emerging model, which is not an organization at all but a miscellany (some would say 'a chaos') of creative activity where ideas are shared, exchanged and remixed with fewer controls. Compelling products and genres emerge from this creative openness that challenge the organized model. Their tools are found openly on the Web, content is increasingly open and if protected adheres to creative commons rather than statutory, territorial recitals. It is a world where the design principle is governed by the preposition WITH people instead of TO and FOR people. It's a model designed around the choice people have to pay or not to pay with their attention instead of being given privileged access to copies.

In this article I am therefore arguing that in order to remain viable and relevant, organizations such as those most of us in IASA work in, must avoid the trap of thinking that mass digitization will in itself ensure continuity and relevance. We must engage energetically with the open model illustrated on the right hand side of the diagram.

As a starting point I had the idea of a list of twelve themed activities that are commonly encountered or which are beginning to be experienced, especially in projects that are about access to digitized collections. Some of these activities are within our Association's comfort zone but others remain marginal and poorly perceived, even resisted. The list is by no means definitive or exclusive.

I group these twelve themes into the four quadrants of a grid, whose vertical axis ranges between being relative strengths and weaknesses and whose horizontal axis denotes a scale of 'hard' to 'soft' leadership challenges[1], where 'hard' denotes doing things for measurable benefit and in a scientific manner by breaking work tasks down and allocating them in the right order to the right people, while 'soft' denotes social awareness and sensitivities, having to relate yourself to others and to differing circumstances and adapt accordingly.

	Hard skills (being, doing)	***Soft skills (adapting, relating)***
Strengths	Effective policies governed by strategy and branding Applying best practice to collections management Collaborative projects	Communicating with stakeholders Licensing content Sustaining services
Weaknesses	Curation of data resources (lifecycle stewardship) Coping with massive amounts of data (& metadata) Dealing with new genres	Open to social sharing & exchange Digital literacy Change management

Each of these twelve themes will be described in relation to the Archival Sound Recordings project and the emerging challenges of the Digital Research Centre. I regard both of these as instances of generalised change taking place within the British Library.

I'll begin with those three activities that are already carried out with a measure of competence. They are also the activities that have received the most attention in training initiatives.

Effective policies governed by strategy and branding

The pursuit of excellence should be a primary value for any organisation. Knowing if you have achieved or failed to attain excellence will depend on how the terms on which the work that is carried out have been defined. The British Library has devoted a lot of time in the last decade to answering the question 'What are we doing?', and more specifically, 'What is the purpose of a national library in the 21st century?' Answers came in the form of various statements defining mission, vision, strategic priorities and organisational values.

[1] leadership challenges can be represented as four inter-dependent activities:
Being (spirit)
Doing (getting things done)
Adapting (learning and changing)
Relating (connecting and responding)

In other words, a framework emerges that supports a more economical and purposeful deployment of resources against which notions of success or failure can be objectively measured.

Most organisations will have considered these things if they are to function well and deliver value for money and relevance for the public subsidies they receive. For the British Library the mission is not, as many once believed, to acquire every possible book and sound recording and catalogue them but *Helping people advance knowledge to enrich lives.* Its accompanying vision looks in four directions:

- playing a leading role in the changing world of research information, i.e. adjusting services to be more flexible in order to meet a variety of user needs;
- existing for everyone who wants to do research – for academic, personal or commercial purposes, i.e. not the privilege of those who are or have been in higher education;
- promoting access to collections and expertise through integrated services that are increasingly time and space independent, i.e. not expecting everyone to have to use services, such as catalogues, that are only available in reading rooms located in London;
- connecting with the collections and expertise of others, and working in partnership to fulfil users' needs, i.e. "no archive is an island".

Note that each of these statements is about looking at what people are doing rather than striving to keep up with the latest technological wonder: it is a vision that addresses not what impact the Internet, for instance, will have on the organization but how the organization can best serve society to make the most of the opportunities the Internet and other new technologies offer.

A clearly stated vision, available for all to see, then allows a set of strategic priorities and organizational values to emerge that supports the organization's brand – something people can identify with instantly, something they can trust and respect.

The most predictable of the British Library's six key strategic priorities up to 2008 was 'Grow and manage the national collection' and yet this apparently obvious activity, which might be better stated as an **acquisitions policy**, contained a number of features that remained inadequately covered: the importance of clear statements about provenance and ownership, for instance, which have assumed ever greater prominence as libraries and archives seek to expose more of their collections on the Web.

Collections have often been acquired haphazardly in the past and many years after a collection or item has been acquired a difficult question may be asked (for instance under Freedom of Information entitlements) to which the answer cannot be found easily. The British Library therefore appointed a Cultural Property manager, with a legal background, who set about ensuring that all acquisitions policies were ethically sound (against a contemporary background of items that had possibly been looted from various embattled zones) and devising a course in due diligence.

Due diligence can be defined as "taking all reasonable measure and making all possible checks to ensure that any item being purchased, borrowed, received or exchanged ... constitutes a legitimate acquisition". All acquisitions (other than those acquired by legal or voluntary deposit schemes) are therefore obliged to contain statements such as:

a. [Name] is the legal owner of the Archive and have been granted all necessary rights to donate the Archive to the British Library;
b. [Name] has the full capacity and authority to enter into this Agreement and the performance of its obligations under it will not result in a breach of, or constitute a default under, any instrument or agreement to which [Name] is a party or by which [Name] is bound or result in a breach of any order, judgment or decree of any court by which [NAME] is bound.
c. That the legal title to the Archive is full and free, without time limit, and subject to the restrictions outlined in 1 (i) and 2 (below), is free from any interest, encumbrances, and any third party rights, and any other restrictions whatsoever;
d. That the Archive has been lawfully acquired;
g. With respect to the Archive:
    (i) [NAME] is not involved in any litigation, arbitration, administrative or criminal actions ("Proceedings"); and
    (ii) no such Proceedings by or against [NAME] are pending; and
    (iii) [NAME] has not received notice of any claim likely to give rise to Proceedings;
h. [NAME] is not aware of any claim that the Archive infringes any right of any third party.

Applying best practice to collections management

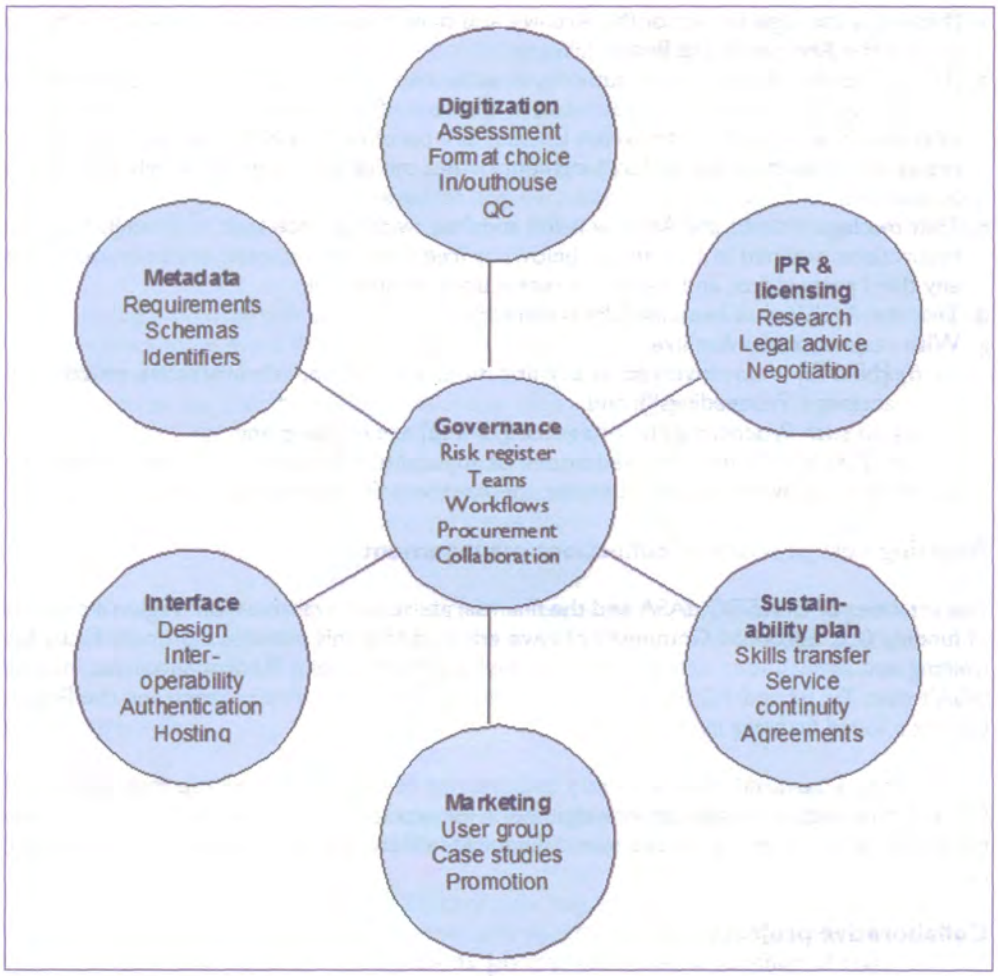
The activities of UNESCO, IASA and the financial assistance available from regional sources of funding (e.g. European Commission) have ensured that this remains a primary focus for training and as such is an area in which we feel justifiably strong. Recent successes include IASA's own TC 03 and TC 04 (2nd edition), the TAPE project, PrestoSpace and the British Library's *Sound Archiving internships.*

Types of work covered include: theory and practice of audio archiving; the management of fragile and unstable analogue carriers; digitisation for access and preservation; signal extraction from originals; cataloguing, metadata and unique identifiers; storage (electronic and physical), etc.

Collaborative projects

The work of audiovisual archives is increasingly about collaboration, for instance, collaboration between archives with assistance from a funding organization, collaborations between teams within an organization and mixtures of the two.

Such projects proceed rather like a complicated juggling act. The objects that need to be juggled can be thought of as a microcosm of the twelve themes of this paper and can be illustrated by means of a diagram known as a 'cultural web'.



Central to this diagram is the governance of the project where various collaborative actions are concentrated. Additional resources (external suppliers, hired in expertise) lighten the burden of making critical masses of sound files and metadata available on-line but they can also add to the list of risks that have to be managed. The Project Manager's most useful tool will therefore be a register of risks, adequately profiled and including controls to be applied when difficulties are encountered. Here is a copy of part of the risk register employed during an early phase of the Archival Sound Recordings project which allows for rapid assessment of risks using colour coding.

Internal /Extern	Risk	Risk Rating	Probability	Impact	Controls in Place	Priority
External	Delay in IPR acquisition	HIGH	HIGH	HIGH	Monitor the external rights-clearer to establish if one person is sufficient resource to undertake the clearances. If not, buy in additional resource or suggest that the rights-clearer employs a researcher. Also continue internal rights research for specific content packages. Carefully monitor progress on a daily basis and push for updates on progress.	Imminent
Internal/ External	Complexity of materials may raise unforeseen issues.	MEDIUM	MEDIUM	MEDIUM	Less of an issue due to ASR experience. Careful planning. More spot checking to root out problems.	Imminent
Internal	Delay in production of METS	MEDIUM	HIGH	LOW	Depending on internal sign-off and early commencement of production. Still dependent upon internal sign off @ beginning September 2008. Sign off must happen by 19/09/08	Imminent
Internal	Scope creep: web requirements	MEDIUM	MEDIUM	HIGH	Careful specification. Revision of web strategy	Remote
Internal	Loss of content due to overestimation of number of hours.	LOW	LOW	LOW	Better understanding of this since ASR but still an issue. Quoted hours possibly an underestimate.	Remote
Internal/ External	Change of content due to complex IPR issues	LOW	LOW	MEDIUM	Closely monitor progress with the more complex packages. See risk ASR2-R-4 for approach.	Remote
Internal	IPR licensing costs higher than expected.	LOW	LOW	MEDIUM	Less likely than with the ASR project as lower risk materials are proposed. Careful management of budget.	Remote
Internal/ External	Emerging usability and re-purposing requirements cut across realistic licensing objectives.	LOW	LOW	HIGH	Keep expectations realistic.	Remote
External	External IPR suppliers cannot do what they claim.	LOW	MEDIUM	HIGH	Suppliers are well versed in the Library needs	Imminent
External	Supplier relationships breakdown.	LOW	LOW	HIGH	Careful contract management and partnership working with open communication. Supplier representation at Project Board.	Imminent
Internal	User testing takes too long.	LOW	LOW	LOW	Careful scheduling. Do less testing as ASR testing extensive. A budget allocation should be made for user testing.	Remote
Internal/ External	User testing casts up too many problems.	LOW	LOW	LOW	Not likely but careful scheduling and early engagement with community.	Remote
Internal	Change of requirements (scope creep).	LOW	LOW	LOW	Drafting of a Project Initiation Document minimises risk. Well defined business case and deliverables list.	Remote
Internal/ External	Criticism for not meeting accessibility standards	LOW	MEDIUM	MEDIUM	To be mitigated by a joint statement with JISC on accessibility.	Remote
Internal/ External	Procurement uncertain.	VERY LOW	VERY LOW	VERY LOW	Much less uncertain since ASR project but issues need to be addressed early on.	Remote

The various collaborators on Archival Sound Recordings were governed by a project manager reporting to a Board, which was itself made up of representatives of external and internal parties. From within the British Library, key people included the head of Web Services, head of Higher Education marketing and various collection heads. The Board was chaired by a Senior Responsible Owner (in this case the Head of the Sound Archive). Well-developed project and people management skills were therefore essential to ensure that deadlines were adhered to and delivery targets met. The risk register was therefore the Project Board's main governance and surveillance tool.

Communicating with stakeholders

Meaningful and regularised conversations with users are essential to the relevance of products and services, but on the understanding that in an unfamiliar situation one is unlikely to get things right straight away. So, when the interface to Archival Sound Recordings was first discussed the Library made the first move and proposed a well-described, well-packaged resource, to which the response from the users was 'give us the raw data'. Having presented the content with minimal metadata and adornment the same group then asked for more curatorial interpretation. We addressed this by introducing some Web 2.0 features, tagging and a weblog.

Encourage feedback from users. This makes them feel a part of the project and it can provide useful material for case studies, or stories, as evidence of demand and satisfaction. For instance, a PhD student who used some of the historic African recordings on the ASR website wrote to us to say:

"The recordings are extremely useful. In Bunyoro kingdom, for example, an official recently told me that they had instruments that are not played because nobody knows the skills and their music. I feel that the music can be restored through listening to the digital sounds...."

Licensing content

Until new business models emerge with legislation to suit, libraries and archives have no alternative but to work within existing legal frameworks, which means consulting each and every contributor and rights holder associated with a given recording and negotiating a license and fee (payable in advance) to cover all expected uses, e.g. streaming, downloading, repurposing, etc, invariably for a fixed term. Familiarity with administrative structures (collection societies and associations) and the prevailing political climate will save a lot of time and frustration and there may be no alternative but to employ short-term expertise. However, even the employment of copyright experts is no guarantee that rights holders, once identified, will comply with a request and laws are seldom free from interpretation – which is not surprising given that most of the legal framework for our actions predates the circumstances that we are trying to address. Neither will payment necessarily be the most appropriate consideration. For traditional music from countries without evolved copyright legislation the solution was to offer digitized copies or a one-off payment to a central body, such as the local musicians' union or national archives.

Sustaining services

The early Web was (and remains) full of isolated, forgotten project outcomes, fit for purpose at a given moment but unable to move beyond the restrictions of code, software, hardware or available expertise. Project management must ensure there is a sustainability plan that will ensure life after the project has ended. The plan devised by the Archival Sound Recordings

project ensured that there would be: a hand-over of skills (e.g. metadata compilation, rights clearance) each of which can be championed by a member of the full-time regular staff; that there is long-term technical support for the software and website design; that there is a migration strategy, including system integration.

Curation of digital resources (or lifecycle stewardship)

I have often used the following image as an illustration of the way we used to be able to do things in sound archives - some of the time:

The picture was taken at the British Library during the course of a move where a number of examples of makeshift catalogues and evidence of half-completed initiatives came to light. I refer to such boxes (or biscuit tins) of knowledge as instances of 'benign neglect'. As long as people continued to be employed by the organization who were aware that the answer lay in one of these tins (and had passed on this detail to their successors) the knowledge was reasonably secure. As an example of lifecycle stewardship it has obvious shortcomings, though the notion that all items in an analogue collection and their attendant documents (acquisition agreements, catalogue records, conservation reports, etc) continue to absorb resources, particularly as storage and conservation costs, is a relatively recent cause for concern.

When digital alternatives emerged during the 1980s it was common to hear talk of such costs as being a thing of the past. By the late 1990s reports began to emerge, mostly from the United States, that warned of the dangers of inadequately informed digitization programmes2 and it became apparent that safeguarding digital collections in perpetuity and on a large scale was likely to be even more expensive. Centres of digital expertise were established, such as PADI in Australia, Sun Site at Berkeley in the United States and the Digital Curation Centre in Edinburgh, all of which continue to produce streams of wisdom and valuable insights for our profession.

2 One of the most influential of these was Jeff Rothenberg's *Avoiding Digital Quicksand* (CLIR, 1998) http://www.clir.org/pubs/reports/rothenberg/contents.html

In short, the dependency on machines to assist with lifecycle stewardship demands a high degree of integration in workflows (especially as applied to preparing objects for ingest), constant technological vigilance (to ensure that hardware and software components remain current) and an eye for exactitude in all matters pertaining to data, particularly the creation and management of directories and file names, not to mention the avoidance of perpetrating errors of discographical fact.

The Archival Sound Recordings project saw very few setbacks, one of which was the failure to devote sufficient time and attention to quality checking the descriptive metadata and the matching of the same to sound files and images. Catalogue records help to find things on shelves and when those few requests came in to fetch the item an expert on the staff could override any infelicities encountered in the documentation. Metadata is more like product packaging, not in the marketing or advertising sense but as a means "of data distribution and processing (an Information Technology issue)"[3]. Mistakes are therefore compounded though being more visible and, worst of all, are liable to be trusted as correct by an online user. An earlier quality assurance measure in the project of one file in fifty to be checked was quickly adjusted to one in ten and for some content packages, every single file was quality assured.

Coping with MASSIVE amounts of data (and metadata)

Total quality assurance is obviously unrealistic for the massive quantities of files that are being generated by semi-automated digitization programmes. At approximately GBP 100 per digitized recording for the Archival Sound Recordings project[4] the added cost of checking every file manually would be unbearable. For organizations that pride themselves on offering unadulterated authenticity to users, however, this remains an essential activity the cost of which will need to be offset by achieving efficiencies elsewhere, such as faster rates for audio transfer and metadata compilation.

Moreover, reports at the 2007 IASA conference in Riga from early implementers (Austrian Media Archive and National Library of Norway) alerted us all to the under-estimates of time it would take to migrate a very large set of data.

Clearly the responsibilities of digital stewardship are beginning to out-strip the capacity of single institutions and some of the processing and storage will, I feel sure, have to be shared, as is the case already with some branches of scientific research. It will be useful to weigh up the advantages and disadvantages of GRID and CLOUD computing and to examine what such solutions might mean for dedicated curation.

While we agonize about how best to deal with our legacy collections, the figures for newly created digital content that is OF rather than FOR the Web dwarf all previously known measurements. People have embraced the creative and participatory opportunities of the Web and the recognition that follows. People project their lives onto cyberspace in as many ways as are available, with thirteen hours of material being uploaded to YouTube every minute (late 2008 statistic). Mobile audio recording devices, such as Audioboo, are emerging at the time of writing that may be destined to reach a similar rate of growth.

We need to re-examine catalogues. The comparative ease with which people find stuff on Google, regardless of authorized spellings of names, and get it presented in ranked order has generated impatience with institutional catalogues, even those blessed with sophisticated search functionality. This is not entirely fair, though the reliance of all catalogues on presenting results as text, possibly in alphabetical or date order, is a severe limitation when large

[3] *Searching for Audiovisual Content.* European Audiovisual Observatory, 2008. p. 32
[4] This unit cost is all-inclusive, i.e. digitization, plus licensing, plus versioning, plus metadata, etc

numbers of hits are returned. Alternative ways to display large sets of data are needed. Apple has demonstrated some success with its well-designed interface, complemented by Genius. Cool Iris and Music Intelligence Systems have evolved appealing applications for video and audio respectively. They are all examples of visualisation:

> *Visualisation* is the process of representing abstract information in the form of images that can assist in the understanding and analysis of the data. The best visualisations convey large amounts of information in a smaller space than can be managed in text. Maps, for example, fulfil such a function, as do workflow diagrams. David Staley's recent book *Computers, Visualization, and History: How new technology will transform our understanding of the past* (M.E. Sharpe, 2003) provides a wealth of examples of the current and potential uses of visual forms in the heritage and education sectors. (DigiCULT, 2005)

Dealing with new genres

The idea that one should archive the Internet as though it is a publisher (on a vast scale) of new copies seems to me to be a misunderstanding. Clearly there are records of events that only exist on the Internet that must be captured and archived on a localised basis. This was easier to do before Web 2.0 let everybody converge with the content. The outcomes of those convergences may in future be a focus for research, in which case we will need new taxonomies for organizing our captured web pages. Lorcan Dempsey wrote in 2007 about several types of metadata[5] including: professional (provided by the originators of the resource as authorized data and controlled vocabulary); contributed (content generated by users, such as tags and comments); intentional (data that is collected from usage that typically ranks search results as a way of recommending certain paths through the data over others).

Such added value adheres to numerous Internet genres, most of which are probably not yet on the list of things to be acquired electronically:

- Podcasts;
- on-line files;
- blogs and micro-blogs (political blogs are said to be "*transforming our democracy*" [6];
- Internet radio;
- Games (with audio).

How do we even begin to find them all?

> *"multimedia search is still in the crawling stage, but sometime in the not-too-distant future, it's going to grow up and take off fast"* [7]

Helping to improve multimedia search are a number of specialised search engines such as Everyzing (http://www.everyzing.com/), Podscope (http://www.podscope.com/), TVEyes (http://www.tveyes.com/) and Google's audio search tool (http://labs.google.com/gaudi).

And so to the final trio of themes, perhaps the least understood within our Association.

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[5] Lorcan Dempsey. *Four sources of metadata about things* (Orweblog May 20 2007). http://orweblog.oclc.org/archives/001351.html

[6] "*transforming our democracy*" Nigel Morris. The online lobby: the blog sites transforming our democracy. The Independent (September 15 2008). http://www.independent.co.uk/news/media/online/the-online-lobby-the-blog-sites-transforming-our-democracy-930391.html

[7] Ron Miller. The search is on. (Streaming Media.com December 15th 2007). http://www.streamingmedia.com/article.asp?id=9879&page=2&c=31

Open to social sharing & exchange - collective intelligence (or the wisdom of crowds)

The traditional connections or interfaces with users, by means of catalogues and enquiry desks, have always been a potential source of mutual benefit in that a certain amount of research may be recycled, over time, into catalogues and curatorial expertise. The interactions help to enhance the intelligence of the collection. The Internet introduces a better connection, replacing identifiers with identities, geographical accident by purposeful interest. If I write something on the Internet and somebody attends to it just by reading it, the chances are that what I wrote will never be found again. But if that same person makes a link to it, and better still, comments on it, it will have extended the network. It will have increased the collective intelligence.

The definition of 'content' therefore expands to include activities that take place around digital assets. Eric Lease Morgan[8] believes that the library catalogue will be "less about inventory and ownership. Instead it will be more about access and usefulness. Put another way, library catalogues will provide information that goes beyond "We have such and such an item" and move towards "Here is a set of items of interest, and these are the actions you can apply against them".

He listed some of the things users expect to be able to do with content found in catalogues (the most common actions are in bold):

> **Annotate & share** • buy • **cite** • compare & contrast • count occurrence of idea • create flip book • **create tag cloud** • **discuss** • do morphology • elaborate • find more like this one • find similar & different • **get** • graph • highlight • **map** • **print** • **rank** • reformat • remove from my list • renew • **save to my list** • **search content of** • search my list • **share** • summarize • trace citation forward & backward • trace idea forward & backward • **translate**

Content generated by users in the form of blogs, links and tags can add enormous value and visibility to collections and since I wrote this presentation, the surprise value of micro-blogging (via *Twitter* and *Yammer*, for instance, off-shoots of teenage chat rooms) has become apparent. Its conversational immediacy removes at a stroke the notion that messages within organisations and between organisations and their users must be carefully managed, by cascade and privilege. Nonsense and rubbish is swiftly identified and ignored: new concepts of etiquette and protocol establish a degree of conformance and acceptable behaviour.

The implementation of so-called Web 2.0 applications into British Library business has been surprisingly swift, its benefits quickly understood. Training is barely necessary: the joy of almost all of these applications is that there are seldom any learning curves to negotiate. You open them up and it is immediately clear what you need to do. It is more a case of being aware and finding the right set of social networking tools for you and your audience. A case in point: I wanted to find a way to create a social networking tool that would enable audiovisual archive professionals to connect with users, and vice versa. A page I put on Facebook in December 2007 languished unnoticed for almost a year. Towards the end of last year a recommendation in Educause [http://www.educause.edu/] led me to Ning. Resources for Studying Sound Recordings was created in about fifteen minutes: dozens of people signed up within a fortnight and after five months there are over 200 members who are free to add their own content, form their own groups and publicise their own activities. Its continued success and relevance will depend on the degree of interest it manages to maintain and the extent of the collaboration.

8 Eric Lease Morgan. *Next generation library catalogues* (presented at at Libraries Australia (October 23, 2008). http://infomotions.com/musings/ngc-in-sydney/ngc-in-sydney.pdf

Digital literacy

This is a phrase encountered frequently and has several meanings. If taken to mean 'I can use *Facebook* and know how to write a blog and contribute to a wiki' then what are the skills that need to be taught and learned?

On another level it equates to a requirement commonly seen in job applications since the mid 1990s – IT skills. The article in Wikipedia begins with a recommendation that it be merged with the earlier article about computer literacy. It proceeds with the following useful definition:

> **Digital literacy** is the ability to locate, organize, understand, evaluate, and create information using digital technology. It involves a working knowledge of current high-technology, and an understanding of how it can be used. Digitally literate people can communicate and work more efficiently, especially with those who possess the same knowledge and skills. Certifications are available to determine if a person is digitally literate.

Among such certifications is Microsoft's on-line Digital Literacy Curriculum in five courses, which starts from the basics of computer literacy:

- Computer basics
- The Internet and the World Wide Web
- Productivity Programs
- Computer Security and Privacy
- Digital Lifestyles

The last of these, 'Digital lifestyles', looks at how digital audio, video and photography are 'shaping the world we live in', creating 'new career opportunities'. Another definition of Web 2.0 sees it as the addition and proliferation of audiovisual applications, such as YouTube, GAUdi and Audioboo, and a whole generation is emerging from higher education into the job market with a different understanding of how the world works as a result of the reduced dependency on teaching by narratives constrained by words on paper and fluency with AV formats that have had their professional aura stripped away by digital.

To paraphrase David Weinberger (*Small pieces loosely joined*) the Web is a space that has no natural boundaries: it is an artificial space that is creating itself and adding new value to sense-making and knowledge through being able to accommodate and organize many views and positions through devices that enable fast sharing and exchange, devices that are increasingly mobile and multi-functional (think i-Phone, not PC). People are carrying around very large personalised collections – their digital lives. Libraries and archives will need to find ways to allow those devices and personalised collections to mesh with their own systems and collections. A phrase often quoted at the second Unlocking Audio conference (London, March 2009) was "if it [content] doesn't spread, it's dead".

Change management

It takes a persuasive thinker to make sense of new situations and show others the way. Those 'others' will follow if it makes sense to them as well. In order to ensure that libraries and archives remain relevant, those in positions of influence in our organizations and in our Association must therefore:

- identify the best practice and the best policies;
- mobilise these quickly and globally using the power of the Web.

Professional associations, such as IASA, are well-placed to help this come about – the TC series being an excellent example of this in practice. As for the future of services to users and ensuring our organizations remain relevant, I have taken note of much of what Charlie Leadbeater has been saying[9] and was delighted to have persuaded him to take part in the Unlocking Audio conference in March, where his message to delegates could be summarised as 'be an ingredient', by which he meant that services and resources should be co-created – users become co-producers and contributors. This will mean new roles for professionals – ensuring content expertise is closely allied to technical/IT skills when designing services and that support is available for inter-disciplinary research and collaborative working. The tone of this collaboration is personalised and conversational, not corporate and prescriptive.

This kind of thinking and capability is beginning to emerge in our profession. It needs to find a new confidence that can help it provide a lead rather than react to the herd. It needs to realise that society is headed in its direction (*Here comes everybody*). To paraphrase Charlie Leadbeater: ***we are all becoming archivists, creating, storing, retrieving, recommending material.***[10]

9 Charlie Leadbeater. The open library. http://www.charlesleadbeater.net/presentations/presentation.aspx

10 Charlie Leadbeater. The Internet and Society in the 21st Century (notes from a British Library strategy seminar, September 23rd 2008, York). http://www.charlesleadbeater.net/home.aspx (Follow link in 'Ideas in progress'.

ILKAR: Integrated Solutions for Preservation, Archiving and Conservation of Endangered Magnetic Tapes and Cylinders[1]

Lars-Christian Koch, Stefan Simon, Elena Gómez-Sánchez, Maurice Mengel, Albrecht Wiedmann

Based on paper presented at the IASA International Conference, Sydney, Australia, September, 2008

1. Introduction

Research and technology for the archiving and conservation of sound carriers often focuses on the needs and possibilities of big audiovisual archives, for instance, on public broadcasting companies. The solutions developed in this context are only partially applicable for research archives, mainly due to the more heterogeneous nature of research collections which require highly specialized answers. As recent studies have shown (Klijn & de Lusenet, January 2008), research archives around the world together dispose of a huge amount of audio and video recordings on magnetic tape. Often the material is highly significant, either as research material in an academic context or as cultural heritage with relevance to a broad public. Since audiovisual recordings are stored on relatively unstable material, digitization and continued copying of the digital files is necessary to ensure the long-time survival of the recordings (Schüller, 2005, Bradley, 2009, p. 6). Currently, most archives are at some stage of the process of digitizing their holdings to ensure long-term preservation of the collections, but digitization brings costs additional to everyday routines and therefore often proceeds slowly (Fuhrhop, Mengel, & Heinen, February 2007). Presently, very few archives are financially, technologically and personally equipped to handle this extra task professionally.

Today, reliable estimates of the life expectancy of phonographic cylinders and magnetic tape are not available. Most estimates agree that institutions have only a small window of time in which to complete high-quality digitization of reel tapes, depending on storage conditions, the storage media and other factors (Hess, 2008). In view of the rapidly-progressing degradation of sound carriers, many research archives are confronted with an existential challenge. Without huge increases in the speed and productivity of digitization, many archives will not be able to digitize their complete holdings before the information can no longer be retrieved. This is the starting point for the ILKAR project, which puts its main focus on the development of criteria, technologies and methods which will enable a more efficient use of the available timeframe. In order to achieve this objective, ILKAR focuses on three main targets:

- Improvement of methods to identify and treat especially endangered cylinders and tapes;
- Improvement of methods to retard the decay process of storage media; and
- Integration of these developments into the workflows of audiovisual research collections.

The project deals exclusively with two types of storage media: cylinders and magnetic tapes. Wax cylinders are comparatively rare today, being a relatively little-known medium from the early days of recording technology. Small collections of wax cylinders can, however, be found in a fair number of libraries or smaller archives. Nevertheless, these institutions rarely

[1] The project acronym is derived from the German name of the project: "Integrierte Lösungen zur Konservierung, Archivierung und Restaurierung gefährdeter Magnetbänder und Wachswalzen". The ILKAR project is carried out by two institutions of the National Museums in Berlin: the Rathgen Research Laboratory and the Department for Ethnomusicology, Media Technology and the Berlin Phonogramm-Archiv at the Ethnological Museum. The project is funded by the German Federal Cultural Foundation through the KUR Programme to Preserve and Conserve Mobile Cultural Assets. ILKAR runs from May 2008 to August 2011. For more information see http://www.ilkar.de.

have sufficient expertise, equipment and funding to deal with conservation, preservation and digitization of such collections. ILKAR plans on making information available to fill this gap.

Today, magnetic tapes in different forms and formats (cassette or open reel, analog or digital, audio or video) make up by far the biggest part of most audiovisual collections in research archives. The decay process of magnetic tape depends on a complex set of factors (storage conditions, tape type, age, etc.) and is generally not well understood (Thiebaut Benoît, Vilmont, & Lavedrine, 2006). ILKAR attempts to improve existing risk assessment strategies such as those developed in the Sound Directions project[2].

2. Roles of Project Partners

The Rathgen Research Laboratory

First founded by Friedrich Rathgen (1862-1942) in 1888, the Rathgen Research Laboratory carries forward the tradition of the world's first scientific museum laboratory. Since then, it has refined its expertise in the preservation and conservation of movable and immovable cultural heritage, contributing to international institutions and organizations such as the International Council on Monuments and Sites (ICOMOS), the International Council of Museums – Committee for Conservation (ICOM-CC) and the International Centre for the Study and Preservation of Cultural Property (ICCROM). It carries out investigations on a broad variety of materials within the museum environment and focuses its research on scientific issues concerning the care of monuments and archaeological sites.

Among other analytical techniques, the laboratory is equipped with infrared spectroscopy (FT-IR), Pyrolysis-Gas Chromatography (Py-GC/MS), optical and scanning electron microscopy (ESEM/EDS), as well as further methods for the determination of physico-mechanical parameters of materials. It also has at its disposal artificial ageing chambers for climatic simulation and mobile systems for the monitoring of the physical and chemical environment in the collections and on site.

As the leading institution for conservation science, art technology and archaeometry at the National Museums in Berlin, the Rathgen Research Laboratory offers its state-of-the-art services in material analysis, consulting, improvement of workflows and other areas not only to the National Museums, but also to other clients.

With its participation in ILKAR, the Rathgen Research Laboratory extends the range of its activities to the audiovisual sector. The research that is being carried out in the frame of ILKAR complements the laboratory's existing capabilities in inorganic chemistry.

The Music Archive of the Ethnological Museum[3]

The music archive of the Ethnological Museum houses, among other collections, a large number of recordings on phonograph cylinders and magnetic tapes. The cylinder collections are those originally assembled in Berlin by the Phonogramm-Archiv, a collection established by Carl Stumpf (1848-1936) in September 1900 as one of the first audio archives worldwide. Under his guidance, and that of Erich Moritz von Hornbostel (1877-1935), the archive grew quickly and contributed to the institutionalization of ethnomusicology, then known as

2 http://www.dlib.indiana.edu/projects/sounddirections/.

3 The official name of the ethnomusicological department at the Ethnological Museum was provided above. For simplicity's sake, we speak of the Ethnological Museum's music archive referring to the same institution.

comparative musicology, as an academic discipline. Some recordings were made in Berlin, for example with visiting musicians, but most of the recordings were made by travelers (researchers, missionaries, etc.) in other parts of the world.

The Berlin archive was one of the few archives that produced copper negatives in great numbers to copy the recordings on the original wax cylinders and to preserve them; due to the galvanic production process of the negatives, these are also referred to as *galvanos*. Under favorable conditions, these negatives have proved to be more stable than wax cylinders. Thus, many of the recordings in the Berlin archive are still in comparatively good shape (Koch, Wiedmann, & Ziegler, 2004).

Cylinder recordings for the Phonogramm-Archiv were made until 1954. In 1999, the cylinder collections of the Phonogramm-Archiv were entered into the UNESCO register, "Memory of the World". As of April 2009, the Ethnological Museum houses 354 cylinder collections with approximately 16,800 recordings on slightly over 30,000 cylinders (Ziegler, 2006, p. 20).

Since the archive was revived after World War II in 1952, a large and diverse collection on magnetic storage media has been assembled. The archive is constantly growing; in 2008, for example, several new tape collections were added, including recordings by Kurt and Ursula Reinhard, Rüdiger Schumacher and the collections of the International Institute for Traditional Music: approximately 3,500 tapes altogether. The total length of all original audiovisual recordings is now estimated at more than 12,700 hours[4].

Whenever possible, the archive kept the original storage media provided by the collectors. Therefore, over time the collection accumulated a wide range of different tape types, forms and formats, including more recent media like digital audio tapes and various video formats. Due to the diversity of different recording media stored in the music archive of the Ethnological Museum, their varying age and relatively controlled storage histories, the collection serves as an excellent test bed for analyzing typical conservation problems with phonograph cylinders and magnetic tape in various forms and formats.

3. ILKAR's Research Foci

ILKAR's two main aims, i.e. risk assessment and retardation of decay processes, are put into effect for the study of the archive's materials under the following workflows. The starting point for these workflows was a set of questions and problems concerning the state of the materials provided following the launch of ILKAR, with regard to both main research focuses. A thorough condition survey of the collections at the Ethnological Museum was then carried out.

Wax cylinders

Regarding the wax cylinders, the priorities are, on one hand, their conservation, and secondly the definition of the conditions for the correct storage of these materials. Although mould infestation and breakages (Exner, 1997) are known to be among the most important factors preventing correct digitization, a thorough survey to assess the current state of the collection was also considered necessary. With these purposes in mind, the following plan has been put into practice, starting with the diagnosis of the state of the collection.

[4] This estimate is from April 2009 and does not include commercial recordings.

Already extant relevant information from different origins, such as paper collection documents, has been summarized into a central database. Essentially, this step concerns the format information about the collection as well as information about their size.

In order to assess the state of the collection, a condition survey, starting with a sampling procedure, was then designed. A correctly-performed sampling procedure allows one to reach a compromise between the need to arrive at a precise and correct idea of the state of conservation and the impossibility of checking every single object for this purpose. A fully systematic sampling procedure was thus developed which should guarantee representative and valid survey results.

Criteria were then defined that enable identification of damage types and risk groups between the different collections. Within the scope of ILKAR, we intend to compile a set of criteria referring to the identification of aging processes of affected cylinders in the future.

Further steps will include the development of conservation procedures for the most common and most urgent degradation processes, as drawn from the previous assessment study, and the definition of ideal storage conditions for these materials, with regards to the risk of certain types of damage (e.g. mould). In this regard, existing ideas on the adequate storage of wax cylinder will be reworked if necessary.

Finally, a permanent workflow for the regular monitoring of the state of the collection will be elaborated and implemented.

Galvanos

Besides the vast amount of wax cylinders, the Berlin Phonogramm-Archiv houses a singular collection of galvanized copies. These copies were made from 1905 on following interest in utilizing a longer-lasting material (von Hornbostel, 1920-1939) that could preserve information more permanently than could the original wax cylinders. This practice has provided us with a unique collection of 'negative' copies or galvanos, from which virtually unlimited new copies can be cast. The present procedure for the casting of these new copies was developed in 1996.

Just as in the case of wax cylinders, ILKAR is attempting to assess the state of the galvano collection. These criteria are based on preliminary work within the scope of a diploma thesis, currently being completed by Dana Freyberg in the Fachhochschule für Technik und Wirtschaft Berlin, the first survey being carried out on several thousand galvanos. So far, deformation and/or cracks of galvanos, as well as insufficient cleaning of deposits left by earlier cast attempts, are the main occurrences that prevent the smooth casting of new copies and further digitization of the information.

The next step is the revision of the workflow for the casting of new copies. The casting procedure of new wax copies has already been described and analyzed. The critical points of the cylinder casting procedure have been identified as the following:

- Galvanos coming in touch with a casting wax of unknown formulation. Copper is usually the main component of galvanos, while a thin layer of other metals such as silver or nickel may appear in its inner surface. Given the high temperatures used to heat the wax in the 1996 workflow, the question arose as to whether these conditions could damage the inner galvano surface, i.e. that which contains the information (West,

1982). Although proprietary information, the precise composition of the casting wax was provided by the supplier in recognition of the value of the historical copies. This allowed for evaluation of the reactivity of these components on the metallic surface of galvanos.

- Uncontrolled and multiple heating-cooling cycles of the wax through recycling, which may force a change in the properties of the wax and subsequent undesired effects, such as the complication of later cleaning of the galvano. Experiments are being designed and carried out that should provide information on this account. The final workflow will be designed to run under milder, more controlled conditions.
- Uncontrolled heating of the galvanos to clean them from wax. Preliminary solubility experiments on wax were carried out in order to dissolve the wax from the metallic surface, thus avoiding heat. We hope to identify a convenient solvent for use in this respect. An easy-to-use device for the cleaning of galvanos with wax deposits is being designed in order to comply with health and safety procedures in museum environments.

As a result of these analyses, ILKAR is designing a new, milder workflow. Further experiments are also taking place which aim to optimize the present working routine for the production of new wax positives from galvanos.

Magnetic tapes

Since the first commercial magnetic tapes were developed in Germany in the 1930s (Clark, 1993, Hess, 2008, p. 240), millions of hours of recordings have been stored in archives all over the world (Schüller, 2001). The recording mechanism relies on a *magnetic layer* capable of 'storing' the sound by retention of the magnetism impressed on them by the recording head. This layer is sustained over a *base film*, which provides structural support. Different materials have been used over time as base films, with acetate, polyvinylchloride and polyethylene being the most widespread in their respective times. A polymeric binder keeps the magnetic layer particles attached to the base film and holds them together. Other typical components of magnetic tape formulation are additives such as lubricants (used to diminish the friction between tape and head in the magnetic layer), plasticizers, stabilising agents, antioxidants, fungicides, dispersants, curing agents and mineral fillers, which are often used to achieve the desired hardness, flexibility or adhesion on the final manufactured magnetic tape.

Given the wide range of materials that take part in the formulation of magnetic tapes, these formulations cannot be expected to have remained constant over the years. Actually, companies used to change tape formulation without notice in order to fine-tune the performance of the products. For instance, the historical changes in materials used in the magnetic layer can be explained by the industry's inclination towards materials with a higher coercivity, a measurement of how efficiently a material stores information (Köster, 1993), and with a higher density of data storage, which requires a small particle size (White, 1990).

However, some of these materials are not stable over time, and information is therefore lost unless certain conditions are provided. Humidity and temperature should be stable and within certain limits, and archive and digitization facilities should be free of avoidable sources of small particulate material such as smoke, food and other sources of dust. If neglected, these environmental agents can rapidly deteriorate the conservation state of the tape (International Standard Organisation (ISO), 2000), (International Standard Organisation (ISO), 2006, pp. 9–11).This, along with the fact that each of these materials may be subject to particular decay mechanisms[5], makes conservation and digitization of all this information a difficult task.

[5] Decay mechanisms have been reviewed and reported elsewhere. See Hess, 2008 for a review, and Bradshaw, Bhushan, Kalthoff, & Warne, 1986 for a specific example of the interaction of different components leading to lower tape performance.

Most of these mechanisms are caused by the degradation of some of the chemical components used in the formulation of the tape, which were not meant to be long-lasting. The best described in the literature [Hess] are those where either the base film or the binding media are the main cause of deterioration, older tapes generally suffering from degradation mechanisms in which the former is involved, being binding media degradation generally responsible for degradation of more recent tape formulations. The difficulty in noticing the behavior of other minor, less spread components makes it very difficult to understand their role in these or other degradation mechanisms.

Some of these degradation processes are noticed only when the tape is played, especially in the cases where the tape is contained in a cassette. Some others are noticeable when it is already too late to act upon.

Supported by scientific facilities at Rathgen Research Laboratory, new tools will be developed within the scope of ILKAR for the identification of materials at higher risk, helping decision-makers to target more endangered materials first.

As with cylinders, the project starts with the diagnosis of the state of the tape collection. A preliminary overview of the collection was achieved thanks to the existing in-house database. This made identification of the most widespread kinds of materials in the collection possible, as well as a more precise definition of the kinds of damage that should be encountered in the survey. These data permit the development of a decision tree which, in turn, should allow for easier training of non-specialized personnel, enabling them to visually identify and report the different kinds of damage appearing in the collection. The lack of specialized personnel and resources, which in turn limits the amount of time available for the assessment of collections, is one of the most common problems encountered nowadays, especially in smaller archives.

The development of a systematic and unbiased sampling procedure that allows for the assessment of the state of the collection in a limited time span and with limited personnel resources was thus one of ILKAR's first considerations. A representative sampling implies taking into account the following characteristics:

- different collections;
- different materials and manufacturers within each collection, meaning different formulations and therefore different decay processes; and
- different life histories: two tapes of the same collection and of the same material and manufacturer may have experienced a very different life history since they were synthesized, and may therefore show different behavior.

The object of the survey is to gain insight into the state of the archive of the Ethnological Museum, and the most frequent kind of materials in the archive, in order to be able to implement a relevant development study. Given the characteristics of the archive, a preliminary sampling procedure organized in several rounds was proposed. According to this sampling, heterogeneity and size of a given collection are particularly taken into account when determining how many tapes of the collection will be entering the survey.

This assessment of the present state of the collection is based on visual examination of the materials. However, once they are visible, degradation processes are already too widespread and advanced to permit stabilization of the objects. According to ILKAR's main objectives, the development of new methodologies for the identification and handling of sound materials at risk, new tools should be developed that are able to point out the start of deterioration

processes. Although already attempted, this research has often proved fruitless. Some authors (Bigourdan, Reilly, Santoro, & Salesin, 2006) have recently cast doubts on the possibility of a simple diagnostic tool due to the plethora of tape formulations, which lead to different behaviors. However, a timely assessment should allow for the preservation and digitization of the information contained in these materials before it becomes irrecoverable. The same authors pointed at the identification of a key property change as the possible lead to be followed in this respect, change that should be measurable under non-destructive conditions, with easy-to-use equipment and by non-specialized personnel. Previous research has mainly focused on the following trends:

- Invasive mechanical studies such as friction and wear tests;
- Free acidity measurements, which up to the present date have not yet been found to be useful diagnostic tools as indicators of tape decay;
- Acetone extraction, which provided data that failed to indicate a general pattern of behavior in degraded tapes; and
- Analysis of the volatile organic compounds (VOCs) released by degrading materials, still at an early stage of development (Thiébaut, Lattuati-Derieux, Hocevar, & Vilmont, 2007).

Integrated solutions

The experience with previous projects at the music archive of the Ethnological Museum has sometimes shown less-than-optimal results concerning application. In the 1990s valuable research on the digitization of wax cylinders was carried out (e.g. the Berlin Wax Cylinder Project and SpuBiTo[6]), the scientific results were published and disseminated among the scientific community, and yet the practical outcomes for our own as well as other archives were comparatively few. This accounts, for example, for research on optical signal extraction from galvanos (copper negatives, e.g. Wöhrle, 1997).

To ensure that the ILKAR research results have a better chance of application in everyday routines, ILKAR includes a separate work package that accompanies the research and development phase of the project. The core concepts of the integrated solutions are:

- A holistic stance. ILKAR attempts to take a holistic perspective, looking at the whole range of archive activities from collecting, preservation, storage, and documentation to making archival documents accessible, in order to provide solutions which are practical.
- Integration in usual workflows. ILKAR will not just publish its results, but will attempt to provide working solutions (e.g. software) to integrate the results in existing workflows of research archives.
- Optimization of the ILKAR results for the specific requirements and abilities of research archives. Recommendations will take into account factors such as highly diverse collections and limited funding.

To ensure that ILKAR's results will be useful for other archives, the project will work together with approximately ten partner archives. As a first step, conservation requirements of these archives will be determined in 2009. Later the solutions developed by ILKAR will be tested in collaboration with these archives.

[6] See http://www.gfai.de/projekte/spubito/papers/smpk2000.pdf

4. Outlook

As described in this article, ILKAR currently focuses on an analysis of conservational problems of the cylinder and magnetic tape collections at the Ethnological Museum in Berlin. Condition surveys will be completed in fall 2009. ILKAR should then have a good overview of actual problems occurring in archival practice as a basis for the research and development phase of the project. Starting in summer 2009, ILKAR will also contact other archives with cylinder and tape collections to determine the specific needs and abilities of research archives with respect to the conservation of these materials and to ensure that the results are not only applicable to the archive in Berlin alone[7]. As to ILKAR's results so far, workflows are already being examined and modified, particularly for the case of cylinder casting; further research into non-destructive preservation methodologies that allow for timely risk assessment will be reported at the IASA annual meeting in Athens, 2009.

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[7] If you are interested, please contact us through contact@ilkar.de

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The soundness of documentation: towards an epistemology for audio in documentary linguistics

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Developed from a paper presented at the IASA International Conference, Sydney, Australia, September, 2008

Introduction

When I began working with multimedia as a member of a team developing curriculum and teaching materials for Australian Indigenous languages during the mid 1990s, problems in linguistic approaches to audio started to become apparent. It was a time when computers came into general use for research and teaching; the most salient development being the rapid growth of the World Wide Web, but it was also when typical desktop computers began to have seamless multimedia capabilities, no longer needing specialised add-ons and settings to play sound[1]. In creating some simple interactive multimedia games for language teaching programmes, I collaborated with linguists who supplied linguistic expertise and audio material, typically from their field recordings. Often, however, field recordings were poor in quality as a result of equipment choices (such as using inbuilt microphones of recorders), recording methodology (microphones far from speakers, or not aimed at the speaker), and an elicitation genre that might be useful for recovering lexical or grammatical information but otherwise containing limited content useful for teaching or attractive to listen to. I drew the conclusion that linguists make field recordings to serve as *evidence*, not *performance*. For an anecdote about how a recording provided evidence of a traditional narrative, even though the narrative was presented in a different form in a grammar (i.e. a notional narrative was constructed), see Nathan 2006b. Even as evidence, audio was an auxiliary; the principal fieldwork products were field notes and the language knowledge absorbed by the researcher. It was as if the primary role of recorded tapes was to provide evidence that the fieldwork had actually taken place.

Following the emergence of the field of documentary linguistics in the late 1990s, audio issues have become harder to ignore. Documentary linguistics, as a response to language endangerment throughout the world, emphasises the collection and representation of a range of language events, where the resulting resources can be drawn on by various disciplines (Himmelmann 1998). Naturally, audio would appear to be its principal medium. The new field attracted many who were already working on minority and endangered languages, and also caught the imagination of many young scholars, as well as the press, the public at large and funding agencies from which language documentation has attracted funding on a scale virtually unknown in academic linguistics. In the UK, for example, SOAS received a commitment of 20 million pounds from the charity Arcadia to set up the Hans Rausing Endangered Languages Project (HRELP), which has a documentation funding component (ELDP), a teaching component (ELAP) and a digital archive (ELAR; see www.hrelp.org for further information). As the archivist at ELAR, I have been privileged to meet and work with a wide range of language fieldworkers and documenters, especially through training workshops for new grant recipients that we run at ELAR in collaboration with ELAP and ELDP. The audio component of this training has steadily evolved across about 10 workshops, with accruing experience drawn from the participants, from applying a variety of teaching approaches, developments in equipment, and a changing outlook on the role of audio.

[1] Macintosh computers had these capabilities earlier, and were favoured by many linguists, often on the basis of having media capabilities (in fact I "cut my teeth" on Apple's Hypercard). Curiously, despite more or less the same cohort still retaining their loyalty to Apple, most have yet to integrate audio into their research methodology.

The event that crystallised the need for an investigation into audio goals was a one-day workshop run at ELAR in February 2006 by Dr Dietrich Schüller of the Vienna Phonogrammarchiv. Dr Schüller characterised linguists' recording methods – and by implication the quality of the resultant "data" – as unscientific, comparing the typical practice using randomly positioned and inappropriate microphones with the conduct of crucial medical research using cheap room thermometers. Since a microphone is the sensor by which we capture acoustic information about an event, then the validity and quality of the resultant data depends on choosing the right sensor and deploying it properly. I realised that although our starting point had been practical recording issues, specifications of equipment, methodology, and evaluative criteria could be formulated only in the service of goals. There was nothing in the documentation literature to even tell us if we should record in stereo or mono.

Recall the abovementioned contrast between "evidence" and "performance", where fieldworkers were described as collecting evidence not performances. Actually, audio materials are rarely evinced as evidence for linguistic arguments anyway (except in some phonetic studies). Although Bird and Simons (2003), and Thieberger (2004) have proposed linking audio to examples sentences in grammars and similar texts (and Thieberger published software to do so), such links tend to provide direct evidence of an example's provenance rather than for the linguistic claims made in the texts. There remains a kind of unspoken and unscrutinised methodological space between audio and the written representations based on it. Exceptions exist, such as in the work of Stephen Muecke, who has been credited with innovating writing that "imitated the spoken word" through "joint authorship" between an Aboriginal story teller, Paddy Roe, and Muecke as the transcriber (Zierott 2005:36, Benterrak et al 1984).

In this sense, audio recordings cannot truly be regarded as "data", despite the frequency with which we hear the expression "my audio data ...". Data in the sciences refers to measurements or records of phenomena within the terms of a model or domain, where these measurements or records can be applied to reasoning and prediction within those models or domains. For language documentation, recordings are supposed to be multi-purpose, and project goals are rarely those that could be directly evidenced by audio signals[2].

The ethical dimension

Fieldworkers enjoy an almost unprecedented access to language speakers, and consistently report the generosity of community members[3]. Simply interposing in the community raises enough ethical issues; seeking to record naturalistic, spontaneous conversation for use by arbitrary others raises far more (Thieberger & Musgrave 2007, Dobrin 2005)[4].

Not only as beneficiaries but also as participants in recorded events, fieldworkers have unique opportunities to select equipment, its locations, and deployment, and to influence performances – all of which have a major influence on the nature of recordings. Because consultants, their community, their descendants and others have a stake in the products and outcomes, an ethical stance would oblige fieldworkers to mobilise their resources (especially those that the community might not have access to) to create quality recordings. At a minimum, this means using the right equipment and applying the skills to use it well. Sometimes, this may make the work harder, for example carrying more equipment, or holding a

2 Goals of ELDP projects include - examining the influence of contact languages, "salvage" of language and culture, dictionaries and grammars, sociolinguistics surveys, and many others. For a comprehensive list, see http://www.hrelp.org/grants/projects/

3 I have only ever heard one fieldworker complain that community members were unfriendly and inhospitable.

4 Some go to the heart of language endangerment, e.g. diverting elders' time away from using the language with their community.

microphone in a particular position for an extended length of time. But, as filmmaker colleague Simon Atkins challenged our trainee fieldworkers: when either you or the consultant has to suffer discomfort in order to achieve a good recording, it had better be you!

Fortunately, there is something inherently ethical about audio. Compared to the flight to text, capturing and using audio is humanistic and transformational. The original speaker is directly represented and can be recognised as an individual by virtue of the sum of information that is captured – spoken content, distinctiveness of voice, and audio cues about the place and other participants who are present. Audio represents community members as social agents who address listeners directly, rather than as consultants filtered through the research apparatus. It provides an unbroken path between the information provider and the final user, with their performances not transformed to writing or mediated by analysis. As a result, multimedia can provide many connections – social, emotional, intellectual, and pedagogical – between the actors and their listeners (Nathan 2006a).

Text, on the other hand, transforms the language and its relationship to speakers:

> Something strange happens when a language is written down. Somehow it no longer belongs to you. It is separated from you. Now what happens when that separate thing seems more real, more important, and more 'correct' than you, the speaker? Do you own the language any more, or has it turned into something which is outside your grasp? (von Sturmer 2009)

This dispossession is compounded by linguistic genres that extract and treat utterances as decontextualised instances of the language system, rather than as socially embedded performances of individuals.

Documenters' audio responsibilities begin before fieldwork, when they acquire and learn how to use equipment. And then responsibilities continue, embedded in the process of negotiating and conducting documentation, not only to ensure that speakers and their community have an input into what is (and is not) recorded, but also to ensure that recordings are made with all the skill required to capture the optimal audio information. In contrast, documentary linguistics' ethical components of audio practice are currently located at the "output" of projects, for example, in "giving back" copies of recordings as "adjuncts or by-products of a 'contract of exchange' between researcher and community" (Dobrin et al 2007). This unfortunately characterises recording as peripheral to the research activity, and locates researchers' ethical responses in the somewhat trivial process of producing and distributing cassettes and CDs.

It is understandable that a previous generation of linguists had low expectations of audio recording. The analogue (tape) equipment they used was vastly inferior to even moderate priced digital recorders that are available today. The enormous weight and battery consumption of reel-to-reel and even some cassette recorders must have made remote fieldwork feel like torture. Recordings on tape clearly had ambiguous value as audio resources; for example linguists undertaking AIATSIS-funded fieldwork (then AIAS) were told to re-use tapes after transcribing them, and not to record narratives[5]. It is understandable that participants at IASA's 2008 Annual Conference received miniature bouquets (made out of a loop of cassette tape) to celebrate the demise of analogue tape!

[5] pc Luise Hercus.

The continual appearance on the market of new, better, and smaller digital recorders is a boon to documenters. But it will be a loss to future language documentation if only their compactness and convenience are exploited. Instead, they provide an opportunity to review goals and techniques, for example, by taking advantage of weight savings to professionalise kit with better microphones, cables and stands. In the widest sense, the recently-completed transition to born-digital audio workflow means that a raft of obstacles to producing good audio have been removed, thereby increasing the onus on documenters to formulate more ambitious roles for audio in the preservation of languages.

Towards an epistemology

Sometimes we start audio training sessions by asking "who has recorded audio?" Of course, most participants indicate that they have. But to the next question "who has published audio", few people put up their hands; some even appear quizzical about the nature of the question. The products of linguistic research and documentation remain focused on text; audio is rarely published or mobilised for any linguistic purpose (except for the occasional online sample, or "giving back" CDs to the consultants and the language community). Sometimes fieldworkers say that they make recordings for the purpose of archiving, which merely begs the question of usages resulting from preservation and dissemination by archives. Put simply, audio is an inconvenience on the way to transcription, annotation, selection or analysis[6].

The characterisation of audio as simply an inconvenience on the way to text is a claim that documentary linguistics is missing a crucial component in its conceptualisation. While this paper is not proposed as a philosophical contribution, 'epistemology' gives a close match to its aims. Alex Barber's *Epistemology of Language* describes an epistemology as a framework that would:

- help to "make decisions on how to investigate the phenomena of language"
- tell us how communication is possible "in the same sense that an interest in, say, our capacity to know facts about the physical objects around us through perception is epistemological" (Barber 2003a: 1)

While most of the papers in Barber's book take a mentalistic perspective and do not consider sound at all, I use 'epistemology' as a placeholder for this missing component, the role of audio phenomena in documentation. It may eventually help to understand how the snippets of acoustic realities that we record can inform the other concerns of documentation.

An epistemology for audio is not proposed just as an extension in thinking about documentation. The *absence* of an epistemology has had detrimental and sinister effects on our practice and its outcomes, arguably heightened by contexts of language endangerment where the recordable linguistic events are in decline, and less likely to be observed again. Without desiderata for what makes a relevant and effective audio, any methodological discussion, advice, or training remains ungrounded.

[6] Of course the need to publish for employment and career reasons sets priorities for many linguists, and the narrow range of publications recognised by academia is part of the problem. But not all of it: if linguists do not challenge this narrow view of language, who will? In addition, linguists are increasingly funded to, or choose to, pursue language documentation, where such "traditional" priorities do not necessarily hold. So we might have expected that the new genres for expressing knowledge about languages would arise from the field of documentary linguistics, although so far this is not occurring.

And indeed it seems that "almost anything goes." Sometimes, an uninformed opinion will do, such as the belief of one linguist that a $2 microphone was appropriate because his recording environment was so noisy anyway. Leaders in the field advance arguments based on simple pragmatism (e.g. that video should supplant audio now that it has become affordable), or sweeping statements that because technology exists, linguists would be "stupid" not to use it (Himmelmann 2009). For many, cursory knowledge about technical parameters of digital audio have become hallmarks of "best practice", but are really trivial proxies for proper training, skills and experience (I called this narrow and semi-religious devotion to numbers and rules 'archivism'; see Dobrin et al 2007). "Best practice" guidelines have made fieldworkers worry about digital *resolution* (ultimately just a matter of recorder settings) instead of *signal to noise ratio*, which has a far greater influence on the properties and value of a recording and is far more complex to understand and manage. The same guidelines counsel – wisely – against data compression, but only of the digital type (e.g. MP3), without warning of the far greater information loss incurred in capturing only a fraction of the available acoustic information. Such technological diversions have suppressed understanding audio recording as both a science and an art requiring appropriate training, experience, and talent. Overall, this sad misunderstanding and neglect of audio amounts to a dangerous de-intellectualisation (for more on dubious assertions about audio see the following section).

Taking up the challenges

At the same time as addressing the need for an audio framework for documentary linguistics, there are also widely-held assumptions that warrant challenge.

For example, we often hear it protested that there is not enough time to set up equipment in the recommended ways because events are too transitory and must be recorded without delay. But in most cases this amounts to a claim that the fieldworker feels no obligation to be properly trained and prepared. Documentary filmmakers, for example, are trained to reconnoitre a situation and prepare for it so that they can begin recording with minimum delay. Many of these cases could be dealt with by simply asking speakers to wait or to tell a story later – when the roosters have stopped crowing, for example – a strategy that depends not on technical abilities but on human skills and the quality of the relationships built up between the fieldworker and consultants. In any case, that "unmissable" event was only unmissable because the fieldworker was present (it may have occurred a week before, or a week after the fieldtrip, for example). It seems that what is at stake is not the event itself but the opportunity to record it, and an inadequate recording may count equally as a lost opportunity. Is there some kind of inverted observer effect here, an over-valuing of the significance of the documenter's presence?

Another frequently heard claim is that equipment is intrusive and distracting. This is often invoked as an argument for using a recorder's internal microphones, i.e. for avoiding the use of well-positioned external microphones. Here again is an odd twist on the observer effect: is the presence of a microphone enough to tip the methodological situation into difficult territory, without considering *anything* about the activities of the documenter? Some researchers, in fact, have argued that the tangible presence of media equipment adds to the theatricality of events and can be of assistance in eliciting several kinds of performances[7].

Video, being a visual medium, captures location in a more concrete way than audio does[8]. Nevertheless, as embodied listeners with two ears, audio can also provide us with spatial

7 pc. Anthony Jukes.

8 The relationship between audio and video, and the role of audio in video, are important topics for documentation but are beyond the scope of this paper.

information that could never appear in video images, such as the location of sources out of frame, and the subtle audio cues that convey the nature of the recording space. Recently there was a debate in several forums about the role of video in language documentation (some of the discussion appears in *Language Archives News*)[9]. I challenged the increasing trend among documentary linguists for using video, much of which seemed to be of dubious value (while very "expensive" in terms of equipment, methodological issues, processing and storage). Others responded with good reasons for the potential value of video, and yet, looking back at them in the context of the present paper, many were arguments for spatial information, not video *per se*. Examples include identifying the speaker in multi-person conversations, capturing emotions and other paralinguistic meanings, and portraying the setting; all of which can be achieved in audio (to a greater or lesser extent than moving image). Despite the undeniable value of video in language documentation, could it be that video has been so enthusiastically proposed and adopted in order to make up for inadequacies in audio recording?

What is most interesting about these various assertions is that they are often put forward as self-evidently true, without evidence, thus providing further examples of the de-intellectualisation of audio.

Audio and events

Audio can be thought of as acoustic information that is increasingly compressed as its traces move along a five-part chain (of which only the first two will be discussed[10]):

event > recording > representations > data > abstractions

Documentary audio results from real-world events – not, for example, from artificially generated signals, or edited together from unconnected sounds. It might be a safe bet to take those events to be spoken utterances[11] because documentary linguistics aims to create "a multipurpose and comprehensive record of the *linguistic practices* characteristic of a speech community ... [where] the emphasis is on the collection and representation of *primary data* rather than theory and analysis" (Himmelmann 1998; emphasis mine).

The relation between an event and a recording is mediated by the physical capabilities and location of the equipment, especially the microphone/sensor(s). But it is not as simple as this. Firstly, those physical factors are considerably modulated by the recordist through his/her selection and deployment of the equipment, and his/her explicit or implicit influence on the acoustic sources[12]. Secondly, "linguistic practices" are generally characterised as instances of genres (Johnson & Dwyer 2002). Although some genres, such as song, may have specific acoustic characteristics, in general genres are *not* properties of the recording but the result of listener interpretation.

Thirdly, "other" sounds in the environment might be relevant too, such as clapping or noises whose sources are topics of conversation. This issue regularly arises in our training sessions,

9 This author's initial article "Digital Video in Documentation and Archiving" (http://www.mpi.nl/LAN/issues/lan_09.pdf), and replies from Patrick McConvell and Peter Wittenburg in the following issue (http://www.mpi.nl/LAN/issues/lan_10.pdf).

10 The other levels are of less interest here - *representations*, typically symbolic, in the form of phonetic or orthographic representations of instances of the linguistic system understood to be associated with the audio; and *data* and *abstractions* which depend on theories and formalisms which give significance to the symbolic representations.

11 Assuming the case of spoken, rather than signed, languages.

12 The common label of "observer effect", referring to the influence on the performers resulting from their awareness of being observed or recorded, is an oversimplification of what really happens in fieldwork situations.

where participants ask how to record in situations where there are constantly chickens clucking, insects buzzing, or craftsmen hammering. While we can show how to optimise recordings under these conditions, this is not really what is at stake. It is as if the question of what counts as focal to a recording and what counts as extraneous is simply left to be dealt with under the rubric of recording technique – as a mere technical matter – due to the absence of linguistic, methodological, and philosophical principles. Whether a child's crying, a bird's tweeting, or the grating of a saw is relevant depends on a large number of factors, each non-trivial, including the documentation goals, the social setting, topics of conversation, and personal viewpoints; and most of these may also change moment-to-moment.

Audio training at ELAR

We have tried to address some of these issues in our training courses for newly ELDP-funded language documenters, where we allocate a little over one day to audio. Although clearly not enough time to do justice to the area, it is the best we can do within the constraints of a six-day programme; nevertheless we have heard from almost all participants that it far exceeds any audio training they have ever previously received.

The training sessions have evolved, in particular with decreasing attention to digital audio topics (signal encoding, digitisation etc) in favour of more perceptual and skill- and practical-oriented activities. This change has corresponded to the rise of the concerns discussed in this paper, at the same time as solid state recorders have become equipment of choice and fostered basic literacy in digital encoding issues[13].

A major theme is developing critical listening skills (Alten 2005: 9). We examine *signal* (what you want to capture in a recording) and *noise* (what you don't want) from several perspectives, which provides a holistic integration of:

- equipment issues (e.g. selection, compatibility);
- moment-to-moment and situation-to-situation skills of managing equipment, settings, participants, and the physical space to maximise signal to noise ratio (e.g. how to capture a speaker's voice against background noise);
- quality: what counts as a good recording?
- wider linguistic and ethnographic issues that decide what constitutes a soundscape containing all elements crucial to understanding the event and its linguistic content (e.g. did that voice come from another room? is the sound of that crying child "signal" or "noise"?).

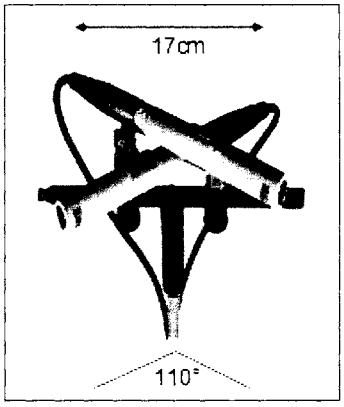
The *goals* of recording ought to be the source of criteria for classifying what is signal and what is noise, which in turn enables the mobilisation of skills to achieve a good recording. Without recording goals, or the corresponding recording skills, results can only be hit and miss. At a workshop conducted by the author and Peter Austin at the Tokyo University of Foreign Studies in 2008, participants were invited to give feedback about the audio sessions. Some offered the honest and revealing response that until the workshop, they had never even *considered the possibility* of managing the recording process to attain better results. They had thought that all they could do was switch on the recorder and hope for the best. Why? Because they had never been exposed to any audio goals or criteria. For them, the workshop had been a happy revelation.

[13] Or rendered them simple and accessible as menu settings of recorders. I estimate that the proportion of fieldworkers using solid state recorders has increased from around 10% (5 years ago) to 100% today.

The apparatus we use for training includes a set of chained amplifiers and headphones that allows all participants to listen simultaneously, a portable stand to hold dampening material (which is a sleeping bag!), CDs of pub noises, pre-recorded audio of various types, and a range of recorders, cables and microphones. Sometimes, groups of three or four are sent out to various locations to make short recordings. Later, the whole class listens to them, trying to correlate their strengths and weaknesses with the equipment, techniques, sources and locations that the group had used. More recently, we try out various configurations of equipment, props and volunteer speakers "live" in the classroom while participants listen using the headphone system. This has proved extremely effective, as participants are more likely to be convinced by the incontrovertible evidence in front of their eyes as they hear the effect of, for example, changing between a lavalier microphone and a shotgun microphone when monitoring the sound of a speaker standing in front of a window onto a busy street. Participants can make suggestions and can be set problem-solving tasks, with immediate feedback of results. More generally, the method drills the crucial importance of monitoring when recording.

We recently added the topic of capturing spatial information, covering basic psycho-acoustics, and listening to audio from stereo and ORTF microphones. Encouraging groups to experiment with spatial recording provides a range of learning opportunities. For example, one group recorded an interview in a noisy environment using a stereo microphone (RØDE NT4, XY type). When asked later which way they had aligned the stereo axis, they admitted they had not thought about it at the time (it would have made a good item of metadata – see below). Actually, they had aligned the two speakers (interviewer and interviewee) off the stereo axis, i.e. achieving no separation between them. Nevertheless, we found this to be a useful strategy. The competing background noise could be separated from the interview, which makes for a more comfortable-to-listen-to and easier-to-transcribe recording than one using the other axis to separate the two participants from each other but not from the background noise.

To achieve a full 3-dimensional "spatial illusion" when listening back using headphones, a specifically configured pair of microphones can be used (Alten 2005: 24). The configuration shown in the diagram is known as ORTF[14].



[14] From 'Office de Radiodiffusion Télévision Française', who invented it.

Participants hear and discuss several ORTF examples: pre-recorded conversations, fieldwork examples made by the author, and "live" monitoring as described above. We also performed an informal experiment, which involved recording an interview against a background of multiple conversations. We compared two versions of the recording: a full-resolution mono version, and several degraded ORTF versions (degraded by applying various levels of MP3 compression). We found that even significantly compressed ORTF-recorded versions were preferable to listen to, because they still provide enough separation of the sources to allow a listener to engage with the content. The mono sound-stage, despite its *prima facie* higher quality, collapses all the conversations into a single space and leaves the listener continually confused and unable to focus on the interview.

Preliminary results are that our training participants agree that, by using ORTF:

- separation and localisation can be achieved;
- more knowledge about the recording environment is captured;
- on the other hand, the richness of captured information can sometimes be distracting[15] and recordings made in some environments are very difficult to listen to[16].

We are not at this stage advocating that fieldworkers use ORTF, since more work needs to be done on understanding its properties, and the setup is somewhat unwieldy; nevertheless it has proved a good way to illustrate the potential for spatial audio and how much information is lost if it is ignored.

The final training theme is metadata. Metadata is commonly defined as *data about data*. Its function is to provide the keys to managing, understanding, identifying and retrieving data (OAIS 2002). It also thus "defines and constrains the audiences" for audio resources and how they can effectively use them (Nathan & Fang 2009). In current language documentation practice, metadata for audio recordings typically consists of information about the location of the recording, and information about the speakers – their names, sex, age etc. Less frequently, fieldworkers note technical details such as equipment type and settings. Virtually no fieldworker notes down the information that can be crucial for a spatial characterisation of the event – how the microphones were arranged, their relation to the sound sources, and the layout and nature of the nature recording space. Even simple information about which speaker is found in which track in stereo recordings is omitted[17]. Diagrams and photography would be useful tools for some of these categories of metadata.

Psycho-acoustics and spatial information

Psycho-acoustics is the study of human perception of sound. Much of it is concerned with our sophisticated ability to understand the physical space we are in through the audio information we receive via our two ears. A mono recording can also convey an impression of a space; for example echo with a certain delay will suggest a large acoustic space, and relative intensities suggest how close or far a source is from the microphone. Nevertheless, a source cannot be localised in the sense of knowing where it is within a 3-dimensional "sound stage".

Humans in real listening situations experience "spatial or binaural localization" by using two ears "to localize a sound source within an acoustic space" (Huber and Runstein 2005: 62).

[15] A minority of trainees found that the increased life brought to the recording by ORTF made it distracting for them. This may be due to the novelty of this method and may be overcome if more frequently experienced.

[16] A recording made in the domed plaza of the British Museum was very disorienting. It seems that there is exaggeration of some kinds of echo.

[17] This information is likely to be found in a technical transcription format such as ELAN or Transcriber, but these require special software and skills, and will not be accessible to an array of listeners who simply want to know which speaker appears in each channel.

This takes into account not only sounds received directly from sources but also those reflected from passive objects in the acoustic environment. Walls, floors, windows, plants, furniture, and human bodies all modify and reflect sound, thus contributing to the amount, quality and duration of sound reaching the ears.

Aural processing involves the ears *and* the brain[18]. We interpret the space around us by comparing and analysing the following properties of sounds reaching each ear, and the differences between them[19]:

- intensity – due to different distances travelled, and the falloff of energy according to the inverse square law, each ear receives sound of different intensity;
- phase/delay – due to different distances travelled, sound reaches each ear at slightly different times;
- frequency falloff – higher frequencies lose energy faster than lower frequencies, so sounds travelling different distances have different frequency distributions;
- frequency colouration – sounds reflected off different materials (and cumulatively from multiple reflections) will have different frequency distributions.

Audio information is processed in the context of the listener's knowledge: his/her transient knowledge (gained through any of the senses) of the current environment (e.g. location, orientation and changes in audio sources), as well as long term experience, as an embodied actor in the world, of how perception is influenced by the nature of sources, materials and spaces. The fact that processing takes place under the guidance of long and short term experience accounts for phenomena such as quickly losing awareness of the presence of fans, traffic, or even chickens, when listening to somebody speaking.

At a conscious level, we can be aware of and direct our attention to particular sources. This underlies what is commonly called "the cocktail party effect",[20] the ability to pick out the speech of one individual even in a crowded and noisy environment. This effect can be regarded as a showcase of human listeners' capacity to mobilise spatial information for useful functions.

Lost in space

The preceding section described the massive amount of spatial information available to a listener, and how listeners use this in everyday life. But how much of this information can be recorded? With good equipment and techniques, much of it can be captured in a recording. The word "captured" is important here because perceived spatiality is not inherently present in a recording. A recording can only make the information available to a listener capable of interpreting multiple informational cues to experience a "sound stage" resembling the recording environment. The ORTF method of achieving this was briefly described above. However, the science and art of stereo and other types of spatial recording are large and complex topics beyond the scope of this paper. My aim here is to argue that spatial information cannot arbitrarily be ignored and that it may be invaluable in language documentation.

Spatial information appears irrelevant to the documenter who aims to move quickly to transcription and to work only in text. This workflow involves a *loss* of information. How

[18] It also involves transmission through the body and the head, and high level integration with other senses such as vision.

[19] More spatial information is available (through triangulation) if the listener - or any other object, whether emitting, reflecting or absorbing sound - is moving.

[20] Also known under the more proletarian label "the cafeteria effect".

much information is lost? Let us roughly estimate the quantities over a 5-second utterance[21]:

Information type	*Bytes of information in 5 sec speech*
acoustic	44.1KHz x 16bit x 2 (stereo) x 5 sec = about 900,000 bytes
transcribed	3 (syllables/sec) x 2 (bytes/syllable) x 5 sec = about 30 bytes

Losing information is not in itself a bad thing. Information theory tells us that losing information is the essence of moving from information to understanding; as long as it is the *right information* that is discarded. The documenter who quickly abandons audio in favour of text eliminates masses of information (over 99.99% of it!). It is unlikely to matter to him where that information is lost, whether at the audio sensor (e.g. through poor choice or use of microphones), the recorder (e.g. through incorrect settings or compression), subsequent processing (e.g. conversion to mono or different resolution), or, indeed, poor reproduction for listening (e.g. listening through cheap computer speakers). None of these deficiencies impacts the outcome of this documenter's work – until a teacher, community member, researcher or multimedia producer comes along with a project that requires good quality, listenable audio, or audio that accurately portrays the whole of the recorded event.

Putting it together

This wider informational and psychoacoustic background helps to understand common problems in recording. Many documenters are surprised to find that the audio recordings they made were spoilt by the presence of extraneous noises. All of them, of course, had been present in the recording environment, but had been psycho-acoustically "filtered" at recording time[22]. This is only one of an unlimited number of ways in which a recording can fail to convey the original acoustic experience.

The extent to which a recording counts as a "spoilt" or inferior version of the original event depends on a number of factors, many of them subjective and depending on the purposes for listening. But there are also objective factors based on the types and amounts of information that were present for a listener in the original setting and whether they are accessible to someone listening to the recording:

- the acoustic (especially spatial) information in the recording environment;
- the listener's knowledge.

These have very different implications for the eventual listener. If acoustic information is missing (or distorted) the listener will experience the event differently. We have seen that spatial information can be the most important component, because the ability to separate simultaneous events is crucial for intelligibility and for sustained listening without disorientation.

21 Assumptions: acoustic information is quantified on the basis of CD-audio, which is extremely conservative; speech is at the rate of 3 syllables per second; a syllable can be written as 2 characters, each of which is 1 byte in size.

22 This class of problem can generally be avoided by monitoring the recording through closed headphones, which forces the fieldworker to "hear" from the perspective of the microphone(s), rather than as a human participant. But this may not be feasible if the fieldworker needs to elicit or converse with consultants.

While a good recording can capture most of the acoustic information, a listener to a recording can never exactly replicate that of an event participant, even if only for the fact that those participants knew about the location and what was happening in it before the recorder was switched on[23]. Thus, the extent to which listening can correspond to original experience is dependent on who is doing the listening and on their knowledge about the participants, location, and history of the original event.

On listening

Throughout this paper, the 'listener' has been a key concept. Until now, documenters have been under the mistaken belief that they can think about recordings in terms of what they contain, instead of having significance only for a listener. Of course, if no-one ever listens to them, their only significance is as a memento of fieldwork. Once we factor listening – and listeners – into documentation, we can talk about what we record a particular event *as*, for example as a performance of a story, as evidence for a syntactic or phonetic phenomenon, as a teaching resource for children etc. In each case, we can hope that listeners can have a useful experience, without naively assuming that we are directly delivering a specific content. We also acknowledge that the act of recording constructs its listeners, whether imagined or not, because, just like video, an audio recording imposes a point of view that "constructs knowledge about its subjects as 'others'" (Kheshti 2009:15). Kheshti notes that:

> the positionality from which sound recordings are produced, and the aural perspective that recordings attempt to elicit, enables us to ask: what kind of sonorous body is being materialized though these production techniques and what kind of listener is being produced?

The idea of recording for listeners is, of course, as central to the music industry as it is novel for documentary linguistics. For us, it opens up new ways of thinking. For example, consider the capacity for the "cocktail party effect" discussed earlier. This capacity declines with age and is particularly affected by hearing disabilities. It means that a recording which insufficiently enables a listener to pick out the focal speaker from background talk could be classed as a recording "as heard by a hearing impaired person".

And there is a qualitative property we could call "listenability". As a result of group listening to many recordings in training sessions it is clear that people typically agree about listenability. For example, two recordings that are equally intelligible and clear can differ significantly according to how comfortable or pleasant they are to listen to, and most people concur in judgement. Given that language documenters are likely to be the greatest listeners to their recordings (since transcribing an hour of audio can take 50 or more hours of listening) it is a valid part of a research methodology to aim to make recordings that are comfortably and sustainably listenable over long periods using headphones[24].

Here is another example. Recently a documenter, Carolina Aragon, was explaining her difficulty in recording the Akuntsú people of the Amazon because their forest environment seems to be perpetually full of loud bird and animal calls (and she believes it would not be safe to record them elsewhere). She asked about techniques to overcome these "noises", but seemed to have already tried almost every suggestion I could offer. However, there was a greater lesson in this: since the Akuntsú people hear their language in this noisy soundscape, it raises interesting linguistic questions about how those speakers and listeners deal with

[23] Metadata might supply some of this knowledge or "missing" information.
[24] Documenters do ask for advice about suitable headphones for sustained listening, but not about how to record.

it. Further, it tells us that thinking about what we seek to do in recording, and therefore how we record, is a relevant and important part of any investigation into the acoustic phenomenon we call spoken language.

Conclusion

This paper has shown that audio is a rich, complex, and rewarding component of language documentation. Much more thinking needs to be done regarding its role in documentation and related areas of linguistics.

The practical and aesthetic aspects discussed could be summarised as a set of desiderata for evaluating recordings:

- accuracy: how well is the signal captured, as true to its sources and without distortion?
- intelligibility/information accessibility: can the desired content be identified?
- signal vs. noise: is the ratio acceptable? Can the focal source be separated from all sources of noise?
- listenability/comfort/aesthetics: is it easy on the ears? Will it be debilitating to listen to for an extended time?
- localisation of sources: is enough spatial information captured?
- separation of noise sources: can all the sources of noise be separated?
- representation of environment: are the acoustic properties of the recording space appropriately represented?
- content (identity, performance, uniqueness, coverage): were the right people recorded doing the right things?
- editability/repurposeability: is the recording suitable for turning to relevant purposes?

Finally, the broader aim of the paper is to stimulate discussion about the goals and purposes of audio in language documentation, and, as an initial contribution to an epistemology, I offer the following:

- an audio recording is made in order to be experienced by a human listener;
- an audio recording conveys what a human listener would experience at a particular location in an event setting;
- the documentation goal defines the audio recording methodology;
- ethical recording respects language speakers and honours their contribution through application of effort and skill;
- a recording should capture spatial information;
- metadata about the recording and the recording setting are required for full interpretation.

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The State Library of South Australia's Audiovisual Digitising Plan

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From a paper presented at the IASA 2008 Conference, Sydney, Australia

The State Library of South Australia's audiovisual collections are relatively small in international terms, comprising about 38,000 items, and they represent only a tiny proportion of the material that the Library is responsible for preserving and making accessible to the public. However, they include the highest risk formats held in the Library; analogue formats that are subject to deterioration and dependent on replay equipment that is rapidly becoming obsolete. This paper explains the State Library's digitising plan for its audiovisual collections. It focuses in particular on oral history and other sound recordings, and sets out the goals, costs and strategies identified to date.

Collection Categories

The State Library has four main categories of collections:

- a general reference collection,
- items published in South Australia or by South Australians,
- non-government archival collections relating to South Australia, and
- various special collections.

The general reference collection contains some audiovisual material but these items can be discarded and replaced if they wear out or are stolen. However the Library has legal and ethical responsibilities to preserve access to all South Australian items for posterity. Legal deposit legislation means that publishers must provide the Library with one copy of every film, video, CD and record they produce in South Australia. The Library also buys copies of audiovisual titles made by South Australians interstate and overseas, and searches for second hand copies of titles published before 1989 when the legal deposit legislation was extended to include audiovisual formats. The Library currently holds about 13,000 titles in these categories, and the collection grows by about 400 items each year.

The Library enters into legal agreements with donors of archival collections as well. The archival records of businesses, organisations and individuals can include significant audiovisual components. For instance, the records of the car manufacturer Holden Ltd, which started in South Australia as a horse-drawn carriage maker in the 1850s, include several thousand films, videos and sound recordings documenting the company's production history, advertisements and training programs. The Library holds about 10,300 items in these categories, also growing by about 400 items each year.

The State Library has actively supported oral history in South Australia since 1987. We provide interviewing training sessions in conjunction with the Oral History Association of Australia, advise on project planning and funding applications, and lend digital field-recording kits to eligible projects. We also have a modest program of commissioning oral history interviews by professional historians. The oral history collection currently contains 7,900 hours of material, and grows by 350 hours each year.

Over 6,000 record discs originally collected by South Australian John Purches is our largest special collection of audiovisual material. It is recordings of mainly American popular music and jazz from the 1920s to the 1950s. The collection features over 1,500 artists, including many of the jazz and crooner greats, and it was reputed to be one of the world's finest collections of Bing Crosby recordings when Mr. Purches's widow donated it to the Library

in 1977. The Library also has a very large children's literature collection. In 2003 we took the opportunity to select from a second-hand dealer's record collection a representative sample of storybook records produced by Walt Disney and other publishers, comprising about 425 titles.

However, all the Library's audiovisual collections combined represent only about one percent of the Library's South Australian and special collections. South Australian newspapers alone represent 10 per cent, and are another high-risk format due to the poor quality of newsprint. Preliminary work on the Library's digitising plan has found that no more than a quarter of one percent of the South Australian collections has been reformatted over the 15 years that digitising technologies have been available. No sizeable collecting institution aims to digitise all its holdings, but preservation imperatives as well as the growing expectations of users and funding allocators mean this rate of digitising must be accelerated.

Refining the Scope

It has taken some time to determine the size of the State Library's audiovisual collections. The total figure of 37,700 is becoming more and more accurate for preservation purposes but is still a bit rubbery in places. It excludes copies that have been made for preservation and access, but we are not yet consistent about counting multiple holdings of published items, or counting new items added to some parts of the collections each year.

Broadly speaking, librarians count titles and archivists count linear metres – neither method is particularly useful for managing audiovisual material, especially for preservation purposes. Nevertheless, the Library has come a long way in recent years. Until 2004 the figure quoted in the Library's Annual Report for the published audiovisual collection was almost 70,000 items higher than it is today. It was a meaningless figure because it included a massive unsorted collection of second hand record discs from a retired dealer. Once the South Australian and children's literature content was extracted, and the rest disposed of with the donor's blessing, we re-set the counter at 16,440 and have proceeded from there.

Other counting and identification projects are giving us detailed information about particular formats. Videos are the most challenging to manage because of the proliferation of formats, each with a specialised replay system. We now know that the Library holds 17 formats. We also work closely with a local businessman with a lifelong interest in video formats, who collects and maintains obsolete equipment. Every can of motion picture film in the Library has been examined to identify and extract any nitrate footage. Nitrate film, which ceased production in 1951, is at the end of its lifespan and needs urgent intervention if its contents are to survive. The Library has a cooperative arrangement with Australia's National Film & Sound Archive (NFSA) whereby they reformat and store our nitrate film and both institutions make surrogates available to the public. Most film is acetate-based and subject to vinegar syndrome decomposition. The Library has tested every reel, separated those already in the rapid stage of decomposition, and staff are systematically repairing, rehousing and reformatting them.

The Library's latest activity is a survey of every record disc to identify those that are lacquer or shellac. The lacquer playing surface is inherently unstable and shrinks at a different rate to the substrate of metal or glass. The shellac is very brittle. Staff are assessing the condition of each, flagging those that have already started to craze or delaminate, and beginning to digitise those that can be managed in-house.

The Window of Opportunity

Major sound archives worldwide are in the midst of transferring their analogue material to digital mass storage systems. The National Library of Australia has already digitised 50 percent of its oral history and folklore collections, amounting to more than 20,000 hours. They plan to complete the other half before 2020[1]. The United States' Library of Congress and the great audiovisual archives of Europe, which measure their collections by the millions of recordings, are working to the same kind of timeframe. They too are stockpiling the spare parts necessary to maintain the replay machines, and are well aware that the machine-hours left may fall short of the hours of audio needing transfer. We are starting to use the year 2020 in our planning and funding proposals as well. Meanwhile, many conventional libraries and archives are unaware of the urgency, or maintain the pleasant fiction that while their current analogue equipment is in working order the future can wait.

We have decided that the task of digitising analogue recordings in time is daunting enough without adding to the backlog. We recommend to South Australian oral history practitioners that anyone still using analogue recording equipment changes to a digital system capable of recording at 24-bit, 48 kilohertz, such as a solid state Compact Flash card recorder, or borrows our units. Since making the change ourselves, we have been under great pressure from community groups and professional historians to sell the trusty Marantz CP430 standard cassette recorders that we lent to local practitioners for almost 30 years. However, this will do nothing to stem the tide of analogue recordings requiring transfer, and the Marantz recorders have been put in storage in case they are ever needed as replay units.

Now, half the 350 hours of oral history accepted by the State Library each year are on Compact Flash cards according to our specifications. They are reformatted through the digital audio archiving system in one-fifth of the time it takes to digitise a one-hour cassette. The Library will of course continue to receive older analogue sound recordings for years to come, but by changing to digital field recorders we have freed up more time to manage them.

Selecting for Preservation

Ideally, while a large library or archive may aim to digitise only five or 10 percent of its entire collection over time, that figure will include 100 percent of its analogue audiovisual holdings. This goal will be achievable for a few institutions, but in reality significant amounts of analogue material will never cross the digital divide and must be lost. In some cases this will be a tragedy of missed opportunity, but in well-managed collections it will be the result of pragmatic decisions to ensure that the most significant material is preserved in time. Preservation selection criteria can be applied in four stages, and it is useful to represent the process as a decision tree. The following is the State Library's preservation decision tree for oral history recordings.

[1] National Library of Australia, *Oral History and Folklore Collection - Preservation and Access Digitisation of Audio Recordings*, [2008]. URL:<http://www.nla.gov.au/digicoll/audioprogress. html>.

1. **Does our institution have preservation responsibility for the recording?**

   If No:
   Determine the recording's future status in the collection.
   Consider return to donor, transfer, repatriation or destruction.

   If Yes:
2. **Is the interview and its recording of sufficient quality to justify preservation?**

   If excellent interview + excellent recording → high preservation priority.
   If excellent interview + poor recording → medium preservation priority → serve as transcript.
   If poor interview + excellent recording → low preservation priority.
   If poor interview + poor recording → no preservation priority → benign neglect.

   If high preservation priority:
3. **Is the recording format actively deteriorating or at risk of deteriorating?**

   If No:
   Maintain high preservation priority.

   If Yes:
4. **Is the recording format's replay equipment obsolete?**

   If No:
   Maintain high preservation priority → digitise as soon as possible.

   If Yes:
   Digitise immediately.

Many audiovisual collections include recordings that may be the preservation responsibility of other institutions. The most common examples are radio programs and recordings of lectures, speeches and public events. Also, anthropologists recording indigenous culture in the mid-twentieth century quite often distributed copies among colleagues and collecting institutions. Alternatively, collections can hold unique recordings of no value at all. When portable open reel recorders became available in the 1960s the novelty of the new technology at the State Library resulted in all kinds of odd recordings being cataloged. They included test recordings, book readings (not by the authors) and administrative procedures such as 'Mrs. Fitzpatrick explaining our telex procedures'.

The future status of duplicate and redundant material should be determined during a preservation selection process. Some duplicate recordings will be retained for local access. Others may be transferred or repatriated to the institution with preservation responsibility for the originals. Others should be destroyed rather than put aside for another generation of staff to puzzle over. Of course, all these decisions must be appropriately authorised and thoroughly documented in the catalogue and permanent files.

Most oral history collections will include interviews of very poor recording standards that are unlikely to be used in audio form in the future. The interviews that have high research value should be properly transcribed to preserve the content, but digitising the recordings can be made a low priority. If there are interviews of marginal research value as well as poor recording standards, they can be treated with 'benign neglect'. This means that they will only

be digitised if a research enquiry predates their eventual deterioration beyond the critical point at which restoration will be impossible.

Having identified recordings that have a high preservation priority, the order of preservation can be refined further by examining the condition of the items, and the obsolescence status of their replay equipment. Most oral history collections will be made up of open reel recordings, standard cassettes, Digital Audio Tape (DAT) and MiniDiscs, with perhaps the odd micro-cassette format represented as well. Some collections will include voice recordings on wax cylinders, lacquer and acetate records. The State Library's understanding of the obsolescence status of particular formats has been assisted by IASA's technical publications and the Australasian Sound Recordings Association's seminars, which are strongly supported by Australia's national collecting institutions.

The four-stage preservation selection criteria outlined above was applied to the State Library's oral history collection between 1987 and 2003 to determine which interviews would be transferred to open reel tape, which was the international preservation standard in the analogue era. During that time 3,300 hours of original recordings from a potential 5,300 hours of acquisitions were reformatted by a part-time audio engineer. These preservation open reels, representing original recordings of 'high preservation priority', have maintained that ranking in the Library's current digitising plan.

How Much Does It Cost?

Preserving audiovisual material has never been cheap and is not getting any cheaper in the digital era. Oral history was the original driver for the State Library getting involved in audio archiving. The combination of looming analogue obsolescence and demand for audiovisual content online was the driver for going digital. However, it was not a foregone conclusion that we would continue audio archiving at all, and if the full cost of going digital had been known in 2000, it might not have been supported. Now, the real costs of IT infrastructure are much better understood, and the figures do not seem as outrageous as they would have eight years ago. An initial investment of AU$100,000 in 2004 let us establish a digital audio archiving system based on Cube-Tec's AudioCube and Quadriga. An additional $150,000 has been pieced together over the last four years to enhance and upgrade the original set-up, establish a second workstation and improve the working conditions in the studios. Salaries and server storage space have been additional costs.

In some ways we have been lucky. The initial investment came primarily from the IT budget for the State Library's Building Redevelopment Project. Then, in 2005 and 2008 the Library benefited from end of financial year windfalls from the State Government's Treasury Department. The Libraries Board of South Australia was also able to support some parts of the project through allocating some of the interest on bequest funds before the financial market started falling last year. However, we believe that we have also made our own luck by being prepared to take advantage of every opportunity. Our Preservation section maintains a wish list of equipment, minor works and projects ready to be ordered or set in motion whenever funds are offered.

So, our audiovisual digitising plan is in place: we know what is in the collections, we have skilled staff, proven procedures, the equipment and the infrastructure to get stuck into the analogue backlog. Will we make the 2020 deadline? No, not unless we get about $2m more for salaries and outsourced services over the next 10 years. Our current staffing level (one full-time and one part-time audio engineer) keeps up with incoming oral history donations and makes some inroads into the backlog of analogue recordings. To meet the 2020 deadline,

we will need to outsource some of the work and increase our in-house capacity. The 3,300 hours of 'high preservation priority' open reels are ideal for outsourcing. They are a uniform set of recordings that can be digitised by a commercial agency with minimal preparation on the part of the Library. The cost will be in the order of $500,000, and we have begun putting forward bids for this funding. The bids also include the IT storage facilities that must be prepared for such an influx of digital files. Every hour of spoken audio captured at the preservation standard of 24-bit, 48 kilohertz is 1.02 gigabytes in size. The 3,300 hours of open reel transfers will require 3.37 terabytes of managed storage. We will also need to increase our staffing levels to about three full time positions to digitise the high preservation priority proportion of the analogue backlog by 2020 – given that about 35 percent should fall into the 'low' or 'no preservation priority' categories.

Collaboration and Perseverance

In Australia every State Library knows its preservation responsibilities in relation to newspapers. The Australian Newspapers Plan has been running as a collaborative effort under the leadership of the National Library of Australia since 1991. The State Library of South Australia has so far microfilmed to preservation standards 60 percent of the 410 newspapers published in South Australia since 1836. With the deadline looming for most audiovisual formats, it is time for Australian libraries and archives (and, similarly, those of other jurisdictions) to discuss how to share the urgent task of collecting and preserving analogue audiovisual material. It is particularly important that the scarce resources available for preservation are not wasted by duplicating reformatting already done by another agency. The job ahead is a daunting one, but experience has shown us at the State Library of South Australia that perseverance is just as important as the other preservation strategies, such as surveying collections, managing the environment, technical standards, selection criteria and collaboration. We take heart from the Australian cartoonist and poet Michael Leunig's ode to perseverance, 'How to get there':

Go to the end of the path until you get to the gate,
Go through the gate and head straight out towards the horizon,
Keep going towards the horizon.
Sit down and have a rest every now and again
But keep on going. Just keep on with it.
Keep on going as far as you can.
That's how you get there.[2]

[2] Michael Leunig, *How To Get There*, ca. 1992.

One of two audio digitising studios established since 2004.

State Library of South Australia Audio engineers Peter Kolomitsev and Silver Moon.

Some of the tens of thousands of unsorted second hand record discs from a retired dealer.

Some of the 3,300 hours of preservation open reels produced between 1987 and 2003.

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The IASA Journal is published twice a year and sent to all the members of IASA. Applications for membership of IASA should be sent to the Secretary General (see list of officers below). The annual dues are €40 for individual members and €158 for institutional members. Back copies of the IASA Journal from 1971 are available on application. Subscription to the current year's issues of the IASA Journal is also available to non-members at a cost of €70.

Le IASA Journal est publié deux fois par an et distribué à tous les membres de l'association. Veuillez envoyer vos demandes d'adhésion au secrétaire don't vous trouverez l'adresse ci-dessous. Les cotisations annuelles se montent actuellement à €40 pour les membres individuels et €58 pour les members institutionnels. Les anciens numéros (à partir de 1971) du IASA Journal sont disponibles sur demande. Ceux qui ne sont pas membres de l'Association peuvent s'abonner au IASA Journal pour l'année en cours au coût de €70.

Das IASA Journal erscheint zweimal jährlich und geht allen Mitgliedern der IASA zu. Aufnahmeanträge für die Mitgliedschaft bei der IASA sind an das Sekretariat (Anschrift siehe unten) zu richten. Die Mitgliedsbeiträge betragen derzeit €40 für individuelle Mitglieder und €58 für Institutionen. Frühere IASA Journale (ab 1971) sind auf Anfrage erhältlich. Der Bezugspreis des IASA Journals für Nichtmitglieder beträgt €70.

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