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42ND ANNUAL CONFERENCE OF THE INTERNATIONAL ASSOCIATION OF SOUND AND AUDIOVISUAL ARCHIVES (IASA)

Frankfurt, Germany, 3-8 September 2011

Digital Sense and Nonsense: Digital Decision Making in Sound and Audiovisual Collections

Digital has been with us for many years now, so much so that there is little disagreement in the sound and audiovisual world that digitising our heritage collection is the best way to preserve and sustain access to our valuable content. Virtually all new materials are now collected in digital form so there is little choice but to manage our digital collections if we want to keep them for future users. There are many examples of digital strategies working well, and many new initiatives which expand the number of users we reach and the way we use our collections. So why is there still so much discussion, so much concern? Why are there still so many complex decisions to make? Is it just that there are big hopes but bumpy roads, big promises but limited resources, incredible semantic possibilities but illegible road signs.

Is it due to the varied needs of the disparate field of creators, performers, recordists, intellectual property owners, depositors, collectors, archivists, technicians and users? Is this because of the great diversity in the capabilities, competence and capital of their owners, curators and managers? There is a great range of issues and concerns that we all have in common: digitization now has become a necessity, standards are being agreed upon and mutual solutions are shared — but myths are also created and perpetuated... This conference will be a forum to review the field, investigate and discuss the following subthemes and expose the misinformation in the digital age:

- Facts, advice and misinformation on the digital way
- The challenge of format varieties
- Added value and funding the feast
- Metadata
- Turning archives into assets
- Mass digitization
  - Workflows and bottlenecks
  - Appropriate technology and suitable scale (or when small is beautiful)
  - Does one size fit all?
  - The big, the bad and the ugly
- Open access and open standards
- Access and aggregators
- Managing change in the digital age
- Management myths and technical realities
- Storage solutions (and what about the original analogue material?)
- Collecting sound and audiovisual materials in the digital environment
- Social media and digital sound and audiovisual collections
- Digital preservation and the digital divide: who can afford to digitize?
- Training, education and learning within a digital domain

The 42nd IASA Annual Conference will be hosted by the Hessian Broadcasting Corporation (Hessischer Rundfunk, hr), German National Broadcasting Archives (Deutsches Rundfunkarchiv, DRA) and the German National Library (Deutsche Nationalbibliothek, DNB) in Frankfurt am Main, Germany, 3-8 September 2011.

Please find all conference information on the conference website at www.iasa-conference.com
For any further information or questions please contact the Organising Committee and the conference administrator through enquiries@iasa-conference.com

If you do not have internet access and you would like to register for the conference, please contact the Conference Coordinator Jacqueline von Arb — by phone: +47 98 25 06 28 (GMT+1, or London time + 1 hr) or the Secretary General Ilse Assmann by fax: +27 (0) 11 714 4419

International Association of Sound and Audiovisual Archives

Internationale Vereinigung der Schall- und audiovisuellen Archive

Association Internationale d'Archives Sonores et Audiovisuelles

Asociación Internacional de Archivos Sonoros y Audiovisuales

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Once again, I present your IASA Journal. This is an important issue (aren't they all?) because we have a carefully considered paper on current thinking in relation to our Cataloguing Committee. Some of you will remember that Chris Clark and Ingrid Finnane held a special meeting of the Committee at the Athens conference in 2009. They put it to the members that the Committee had passed its sell-by date in the digital era as cataloguing has become a more integral part of the digital workflow, and as technical infrastructures become available to link data. It was suggested that the Cataloguing Committee become the Organising Knowledge Task Force. The Committee meeting at the 2010 conference in Philadelphia proposed that new concepts and principles should be introduced to the IASA membership at large so that knowledge could be disseminated and work within our various institutions could take shape coherently. Guy Maréchal and Simon Rooks volunteered to take on this task. Their joint paper, 'Organising Knowledge: OK! What our catalogues and metadata have to do with the semantic web and linked data', serves the purpose well, I believe.

And as we ruminate over organising knowledge, Tim Bathgate has us consider how we are, or are not, organised, as a group of individuals and institutions, as a professional entity. Do we consider ourselves sound and audiovisual archiving professionals or are we still working within an emerging profession? This is the sort of paper that allows us to take stock of where we have come from and where we are going to — essential to do periodically for any discipline as it helps determine how we come to do what we do and thus establish gaps in training and knowledge exchange that could strengthen our position and attract increased support (and funding).

Most IASA members will know of the work the Technical Committee is doing to produce 'Guidelines on the Production and Preservation of Digital Video Objects' (TC-06). This is work in progress but as the experts set their minds to the puzzle I have tried, over the past couple of journal issues, to introduce thinking relating to video digitisation. In this issue I've included a paper by one of the experts, Carl Fleischhauer, on the work in this area of the Federal Agencies Digitisation Guidelines Initiative.

Other papers, no less important, but perhaps not time bound as the others are, give interesting insights into projects, methods and histories of a range of technical and content considerations that form part of the work of IASA.

Once again, I'd like to thank all the authors for keeping to deadlines and turning around my queries and demands so quickly and efficiently. We have a conference coming up in September in Frankfurt. I'd like to invite speakers who would like to have their papers considered for publication to seek me out during that week.

Yours truly,
Janet Topp Fargion
Editor IASA

As the current IASA Executive Board approaches the final few months of our term all of us are still thinking, planning, and working towards the future of the organisation. Although IASA was established, and maintains its existence, in support of the retention of historic and legacy sound and audiovisual content, this material finds its purpose in the value placed on it by the present and the future. Likewise, IASA measures its relevance not only because of what we've done but in what we see needs to be done and what we do about it.

The membership of IASA has, over the years encouraged us all to amplify our aspirations and to accept greater responsibilities in the many projects that are underway in the world of sound and audiovisual collections. Our members are the ones who carry the aspirations to fruition, and who forge the relationships on behalf of IASA. These bigger responsibilities and aspirations bring an added burden on IASA, even when members other than the Board do the work.

One of the more significant things undertaken by this Board is the one we are leaving to the end of our term: the newly revised constitution. Undertaking the endeavour near the end of its tenure is not only appropriate, it is beneficial, as the issue has been on the minds of the Board since the beginning of this term, and the combined experience of the current Board amount to many years of service and combined wisdom, all of which has fed into this review. The biggest imperative to change IASA's constitution has been the greater things we aspire to, and the bigger responsibilities we are grasping. Our involvement with the larger community in joint projects and endeavours requires us to have an unambiguous legal existence; and as yet IASA does not have that. The registration of the organisation as a legal entity will legally protect the incoming Board and all subsequent Boards, and will make it easier for us to work with funding partners.

It is exciting to have to be working in this field at a time of such change and challenges, and with so many of us working at the cutting edge IASA has a powerful voice through its members. It's well known that the IASA membership doesn't just belong, they participate and our lively conferences are testament to that. However, though there are many achieving and doing important tasks in the broader field of sound and audiovisual archiving, we always need more to step up to fill the role of running the organisation. The organisation will not prosper without the team who keep it going. Even if you have not been able to accept nomination for a position on the Executive Board I encourage you to find ways to support the new Executive Board, who will be taking office after our conference in Frankfurt. The more you do to help IASA run smoothly, the more IASA can do for its members. Ask any of our board on how you can help.

Our 2011 conference in Frankfurt this September is shaping up to be a great event. The organisational work of "Digital Sense and Nonsense: Digital Decision Making in Sound and Audiovisual Collections" is well underway, the preliminary program is available and registration is open. Don't miss what is bound to be one of our important conferences. All conference information can be found on the conference website at http://www.iasa-conference.com. Of particular importance this year will be the work being undertaken by the Organising Knowledge Task Force. You will remember that the Cataloguing Committee, after many years of fruitful and productive work, came to the decision that it had reached the end of its useful work. However, it was clear to all that the task of information management was vital to the ongoing work of IASA members. This work resists simple categorisation, and questions, needs and expertise in metadata and information management is coming from many parts of the IASA community and across its sections and committees. I hope that many of you will participate in this important work.

All IASA members will soon be receiving a draft of the proposed new constitution to be discussed formally at the 2011 conference. It's the chance for members to add their voice to the future direction of IASA, and one more excellent reason to be in Frankfurt in the first week in September.

Finally, it is with great pleasure that we announce the 2012 IASA annual conference is to be held in India in October 2012. So, while organising to be in Frankfurt this year, remember its time to be planning for next year and so let *From Deutschland to Delhi: IASA, India 2012* be the slogan for the year.

I look forward to seeing you all in Frankfurt in September.

Yours truly,
Kevin Bradley
President IASA

ORGANISING KNOWLEDGE: OK! WHAT OUR CATALOGUES AND METADATA HAVE TO DO WITH THE SEMANTIC WEB AND LINKED DATA

Simon Rooks (Multi-Media Archivist, BBC) & Guy Maréchal (Senior Adviser: Titan & Memnon)

1. Introduction

At the 2009 IASA Conference in Athens, the Cataloguing and Documentation Committee was re-worked as the 'Organising Knowledge' (OK) Task Force. The label 'Organising Knowledge' was engendered by Chris Clark (British Library) whose presentation, with that of Ingrid Finnane (National Library of Australia), amounted to a call to adopt a new perspective on how we create, enhance, manage, link and share metadata about our collections and, crucially, to understand and harness the possibilities of the semantic web. There is an array of sometimes bewildering techniques and practices now widely established including linking data, tagging, user comments, collection building, recommendation and rating. What can they offer institutions such as those represented in IASA, and how do we effectively utilise our knowledge and expertise?

Beyond inspirational papers and a new label, what is next? Those responsible for cataloguing and documentation in established institutions face major challenges in this area. One is to understand better the landscape of resource discovery, navigation, knowledge as brands and products, user behaviours and how contextualising our metadata as knowledge can promote discovery. We need also to engage with leaders in these fields who look curiously and sometimes hungrily at our professionally constructed datasets and aspire to unlock their value.

Following presentations by Guy Maréchal at the 2010 IASA Conference, the Executive Board asked that the OK Task Force progress in these areas with the aim of one or more tutorials at the 2011 IASA in Frankfurt, covering both conceptual and technical issues. Planning for the Frankfurt sessions is well under way and the OK Task Force has prepared several proposals for the Organizing Committee which may be found in the program either as a paper presentation or a tutorial:

- Introduction to the semantic technologies and Linked Open Data (by Guy Maréchal [Senior adviser, Titan & Memnon])
- Opportunities and needs of the semantic technologies and taxonomies for the cultural sector (by Fran Alexander [Taxonomy Manager, Information and Archives, BBC])
- Easy empowering of your cultural data into linked, enriched and structured semantic assets (by Guy Maréchal)
- The migration strategy to reach persistence in small and medium collections (by Guy Maréchal)

2. Illustration of the change by way of a simple example

The usual way of cataloguing and documenting of media assets is to fill in a metadata template for each of the assets and then to store it in a database. The list of metadata depends on the nature of the asset (book, sound recording …), of its cultural domain and other classification and sector rules. Three of the entries are very general: the 'name of the assets', the 'name of the contributor' and the 'hyperlink to the file' representing the asset.

The well known "*Eine kleine Nachtmusik*" has been composed by Mozart. According to the XML, Dublin Core and METS syntaxes, these metadata could look like:

```
<dc:name>Eine kleine Nachtmusik</dc:name>
<dc:contributor>Mozart</dc:contributor>
<mets:file ID="FILE_W002" ADMID="TMD_W002" MIMETYPE="audio/wav"
GROUPID="GW003" SIZE="1" CHECKSUMTYPE="MD5" CHECKSUM="the_md5_file_
checksum here">
```

```
<mets:FLocat LOCTYPE="URL" xlink:href="file://root/path/subdir/
S_2069-B-01-W3.ogg" />
</mets:file>
```

Anybody with a minimum of music knowledge will understand that it is meant that the composer is Wolfgang Amadeus Mozart [1756 – 1791] and that the music involved is the usual name of the Serenade identified K.525! Everybody should also forget about the hyperlink and simply assume that a file coded in the "ogg" format is available representing the audio recording.

From the Information Technology perspective it is precisely the reverse: "Mozart" is simply and not more than a string of characters, and "Eine kleine Nachtmusik" another one! But, through the complex hyperlink, the IT has what is required for presenting you with the beautiful sound of Mozart's music!

The fundamental intention of the semantic technologies is to ensure, by construction, the **interoperability** of applications and navigations through the expression of the relations existing between representations of concepts and their instances with their characteristics - or as Tim Berners Lee put it: the task is to provide "*information that has well-defined meaning, hence better enabling computers and people to work in cooperation*" (Berners-Lee, Hendler and Lassila, 2001). That representation is usually expressed according to a combination of standards languages (using the XML syntax) of the W3C, in particular, the RDF [Resource Description Framework] and the OWL [Ontology Web Language]. The RDF is a general-purpose language for representing information in the Web. The OWL language ensures the definition of the ontologies and of the instances of the classes. A specific language and protocol has been standardized for the searches: SPARQL.

A specialized textual syntax has been designed for expressing the instances of the triples. It is called "Turtle". It allows RDF graphs to be completely written in a compact and natural text form, with abbreviations for common usage patterns and datatypes. Turtle provides levels of compatibility with the existing N-Triples and Notation 3 formats as well as the triple pattern syntax of SPARQL. Obviously, the final users are not exposed directly to these languages - the Graphical User Interfaces hide them, and radically new ways of navigation and querying are emerging which are user friendly.

The semantic technologies allows keeping the current representations according to the usual cataloguing and documentation rules expressed using the well known DC / MARC / MODS / … models [collectively referred to as "**Flat**" models]. The semantic models [collectively referred as "**Rich**" models] can hook and integrate the 'Flat' models.

In the example, for the semantic technologies, the representation of Mozart is a resource, being an instance of the class of things called "Physical person". Figure 1 illustrates the approach.

The rectangles represent "Resources", being identified. The upper rectangle has the class "Physical person". The relation "**is an instance of**" is expressed by the green arrow.

The middle rectangle represents the resource carrying the representations and properties of Mister Wolfgang Amadeus Mozart as an instance of the class "Physical person". It 'owns' the lower rectangle representing the existence of the resource and its associated properties, including the relation "is an instance of", linking it to the class "Physical person". The instance inherits all of the characteristics of "Physical person".

The other lower rectangles represent the files representing Mozart: in the example, the .xml file could carry the classical 'Flat' model according to the Dublin Core of the structural representation of his life (Date of born; … ; marriage; … death); the .odt file could carry a bibliography; the .jpg file could carry the scan of a painting representing him; …

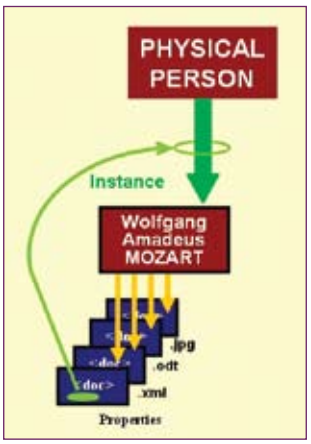

Figure 1: Illustration of the relation 'Is an instance of'

Any of the relations could, through the Web, link data present in distinct databases: this is what is called "Linked Open Data" [LOD]. The OWL definition of the class "Physical person" is in one semantic database [FOAF for example] while its instances, including you and "Wolfgang Amadeus Mozart" who could be described in 27 independent semantic databases linked by LOD and aliases. A network of related data is constructed.

The same construction could be used for expressing the process of Mozart "Composing 'Eine kleine Nachtmusik'". It could be said this is an instance of a resource of the class "Event".

Similar methodology is applied for constructing other types of relations, like expressing that the resource "Composer" inherits the characteristics of "Role" through the relation "specialises". Figure 2 illustrates an excerpt of a possible semantic modelling of the example.

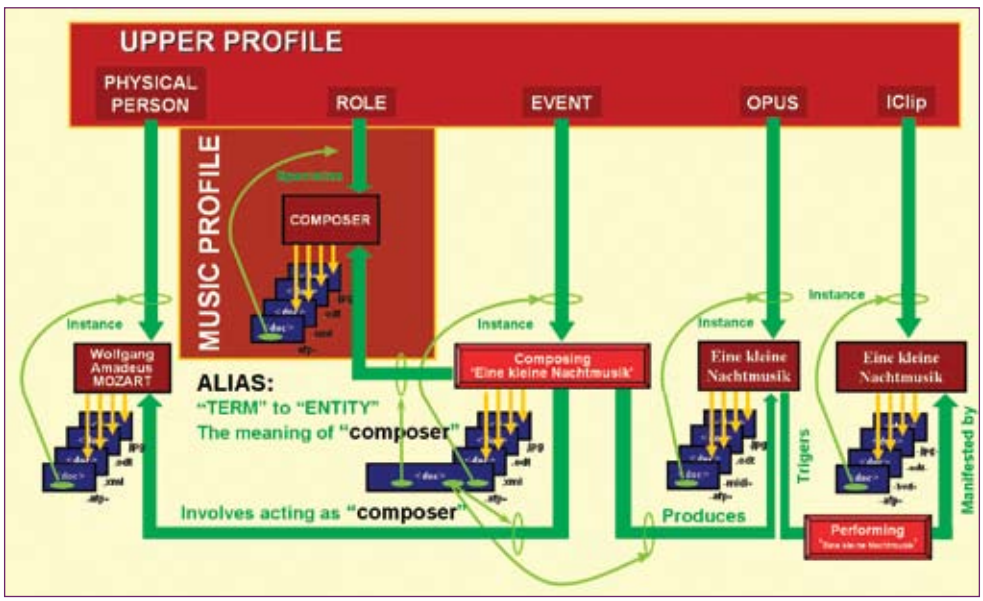

Figure 2: Illustration of semantic modelling

The set of very general classes is called "Upper profile". The possibility of expressing sets of classes dedicated to specialized domains is illustrated by the "Music profile". The resource "Performing 'Eine kleine Nachtmusik'" could also be an instance of the class "Event" representing the performance and its recording in a concert hall. The performing event will produce the resource, being an instance of the class "Logical clip" to which the audio recordings — represented by a set of files coded according to the Broadcast Wave Format [BWF] — and the 'Flat' set of metadata according to the usual cataloguing rules can be attached.

Notice that the link to "Composer" is more complex than other links and that through 'alias' the Flat models could be combined with Rich models.

It is very important to notice that the representations of a physical resource (a painting, for example) are themselves resources (a JPEG file, for example) identified independently of the identification of the physical resource.

A very interesting introduction to the Linked Open Data is available as a video conference by Tim Bernes Lee at http://www.ted.com/talks/tim_berners_lee_on_the_next_web.html. The video can also be downloaded in .mp4 format.

3. The layers of representation of knowledge

The representation of knowledge has to be seen independently from the point of view of humans and of the ICT [Information and Communication Technologies]. Each of the levels could be empowered by the next higher levels: human also by a higher cultural and social education and ICT by training, trials, validations or human error corrections.

3.1 **Textual representation** The textual expression of knowledge is very powerful for producing knowledge and for accessing by humans. The interoperability is ensured between individuals sharing the same culture, the same language and having common social repositories and locators. The complexity and the richness of the grammar rules, of the syntaxes, of the poetry; the voluntary multiple, evocative and ambiguous meanings; the games between sound and sense; …; open doors to utterances that are above knowledge. These expressions can be stored in a persistent manner with no loss of information, but they are not normalised and have poor precision and recall capabilities. This is the level of the Web-1.

3.2 **Tagging** The tagging has a low threshold. In most cases it is sufficient and even fun for the single human user. The interoperability is ensured between individuals and machines through simple standards. It offers moderate precision on large databases but remains with a poor precision on the meanings attached to the tags. The control of the consistency is limited. This is the level of the Web-2.

3.3 **Taxonomies and Thesaurus** This level offers a very high precision but, by nature, is long, difficult and tedious to maintain and is hardly scalable. The interoperability is ensured as long as no changes occur. Level 3, combined with level 1 could be very powerful. This is the level of 'Web-2' with data mining enrichment tools. Retrieval services like Google, Yahoo have demonstrated the power but simple searches could generate thousands of hits.

3.4 **Semantic** The semantic expressions of knowledge are very powerful for producing or accessing knowledge by ICT, but the modes of representation of the knowledge, in a way suitable for human understanding, remain a research area. The precision and scalability are without limits. The interoperability is ensured for all the situations where formal modelling could apply. The recall and retrieval is optimum: the thousands of hits of level 3, become focused to only pertinent and serendipity hits. In concrete trials in large semantic databases, we have often obtained only 30 replies (with 20 or more pertinent), while for the same searches at level 3, millions of replies

were frequent. Navigation in semantic databases and LOD is fun and simple. This is the level of Web-3.

3.5 **Operational** The semantic opens the door to the capacity of computation, inference and operations through 'intelligent' agents. The associated technologies are partly available and already in use in targeted domains.

4. The fundamentals of the semantic web

In 2001, Tim Berners-Lee et al. introduced their vision of the Semantic Web, as an extension of the current Web, in which information has "*well-defined meaning, hence better enabling computers and people to work in cooperation*" (Berners-Lee, Hendler and Lassila, 2001). The most essential part of this next generation Web is content that is formally described via ontologies, metadata conforming to these ontologies, logic, and agents (Antoniou and van Harmelen, 2004). Many definitions of the term ontology exist. The most popular is by Gruber who defines an ontology as "an explicit specification of a conceptualization" (Gruber, 1993). This definition is further extended by Studer et al. to "formal, explicit specification of a shared conceptualization" (Studer, Benjamins and Fensel, 1998). *Conceptualization* refers to an abstract model of some part of the world which identifies the relevant concepts and relations between these concepts. Explicit means that the type of concepts, the relations between the concepts, and the constraints on their usage, are explicitly defined. *Formal* refers to the fact that the ontology should be machine readable. Finally, '*shared*' means that the ontology should reflect the understanding of a community and should not be restricted to the comprehension of only some individuals. By doing so, it captures consensual knowledge (Fensel, 2003). Ontologies occur in different degrees of formality, ranging from thesauri to richly axiomatic structures (McGuinness, 2003).

A huge momentum has recently been gained in Semantic Web research by the ongoing implementation of a vision of a *Web of Data* formulated by Tim-Berners Lee in which formerly fragmented data is connected and interlinked with each other based on the so-called Linked Data principles [Linked Data Principles http://www.w3.org/DesignIssues/LinkedData.html]. The so-called Linked Open Data (LOD) cloud, which represents a huge interconnected data set, has been steadily growing over the past few years.

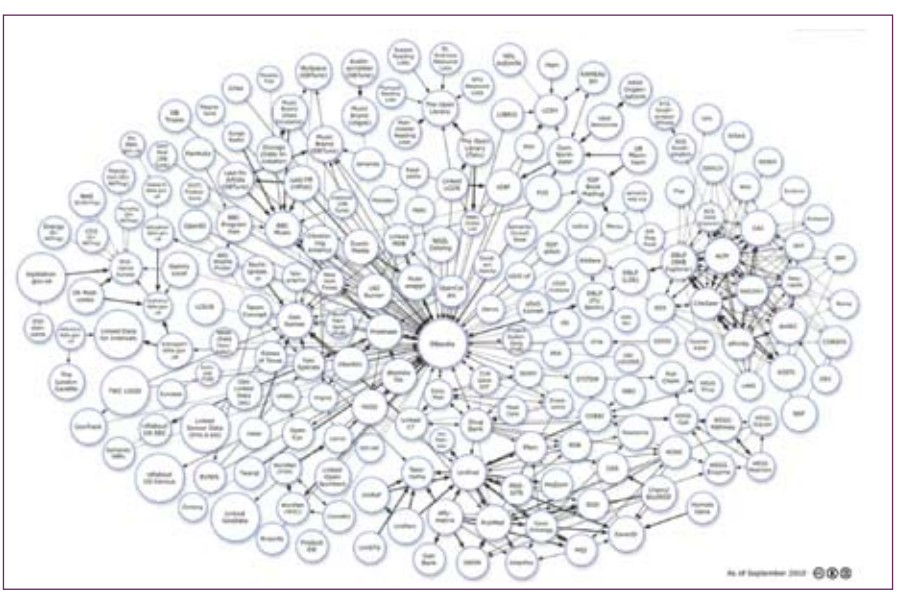

Figure 3: The linked data bubble

In early 2007 the LOD community project was launched within the W3C Semantic Web Education and Outreach group. It bootstraps the *Web of Data* by publishing datasets using the Resource Description Framework (RDF), the metadata model primarily used on the Semantic Web. RDF enables automated software to store, exchange, and use machine-readable information distributed throughout the Web, in turn allowing users to deal with the information with greater efficiency and certainty. Currently, the LOD project includes more than 200 different datasets, ranging from rather centralized ones, such as DBpedia, a structured version of WikiPedia, to those that are very distributed, for example the FOAF-o-sphere. The current LOD cloud contains data from diverse domains such as people, companies, books, scientific publications, films, music, television and radio programs, genes, online communities, statistical or scientific data (Bizer, Heath and Berners-Lee, 2009). Datasets were contributed both by researchers as well as by industry.

The *key success factor* of the LOD movement is the simplicity of its underlying principles:

1. All items should be identified using URIs (Uniform Resource Identifiers);
2. All URIs should be dereference able;
3. When looking up an URI, it should lead to more (linked) data;
4. Links to other URIs should be included in order to enable the discovery of more data.

The cornerstone of the Web is the systematic way of writing hyperlinks to Web pages using a uniformed syntax and protocol. The pages receive an URL [Uniform Resource Locator] and the protocol is "HTTP" [HyperText Transfer Protocol]. But resources can also be uniquely named independently of their location: this is the URN.

The URI concept relates to both ways of identifying resources. Clever ways of organising the naming and locating of resources have been elaborated with structuring and universality. An interesting example is the 'Cool URIs' concept see: [http://www.w3.org/Provider/Style/URI]. In some cases, the use of resolvers allows the management of the links between the URN and the URL of a unique semantic resource.

5. The impact on cultural organisations and on archives

5.1 **General** The current cataloguing and documentation rules are at level 3 of the representation of knowledge. This has all its advantages but also its limitations as introduced at section 3. One of its main advantages is that it constructs a **hierarchical** structure. The semantic level constructs a structure. This means that archiving becomes complex! Isolating a consistent set of resources implies defining consistent scissors rules which are beyond the scope of this introductory paper but will be presented during the tutorials proposed for the IASA conference in Frankfurt (September 2011). At the semantic level, archiving and operations have to be disjointed. In particular, the implementations of the OAIS model have to include an extra persistence protocol. The SIP, AIP and DIP constructs and the PI and PDI could fuse into one representation model called "Autonomous Semantic Object".

5.2 **Structuring between the assets** The semantic approach allows very easy implementation of highly powerful Conceptual Reference Models such as the FRBR, Cidoc-CRM, FRBR-oo. They also allow the links between logical and physical resources and the modelling of the processes (as represented by arrows in FRBR).

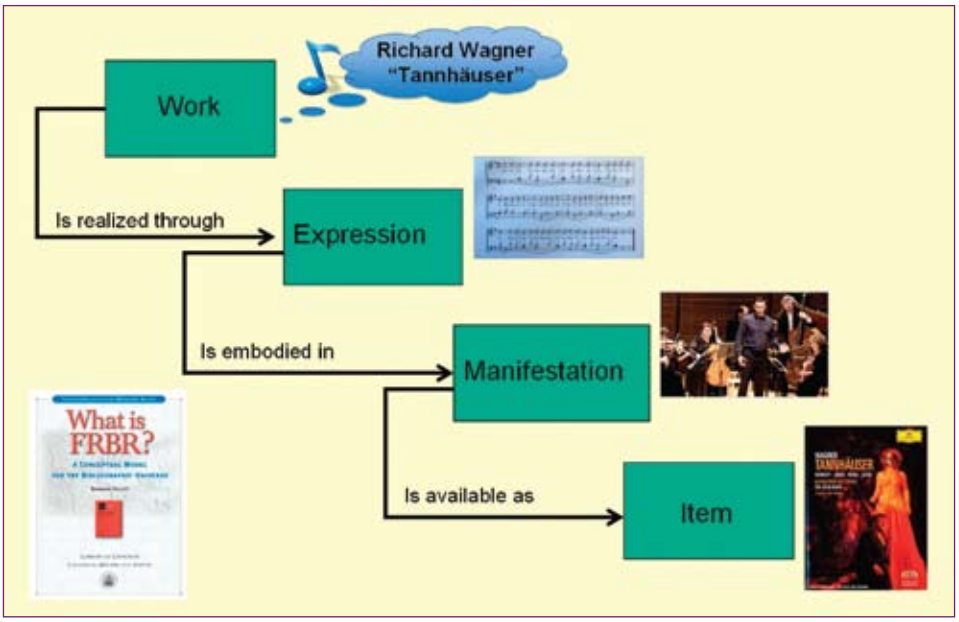

Figure 4: Illustration of the FRBR model

5.3 **Structuring within the assets** The capacity of structuring within the assets is one of the most innovative and powerful capabilities of the semantic approach. The W3C standard, called "fragments", has defined a normalised way of expressing it: each fragment within one media asset can be defined as a resource. This is already in operation for the semantic modelling of TV news and of Interviews: half an hour of News could become 7, 000 ESE [Elementary Semantic Elements]. They structure the news by subjects; they attach and synchronise the transcriptions of what is said and their translations; they identify the speaking persons or presentations on the video; they annotate according to taxonomies and thesauri; they construct exports according to international standards such as NewML-G2 and many other possibilities.

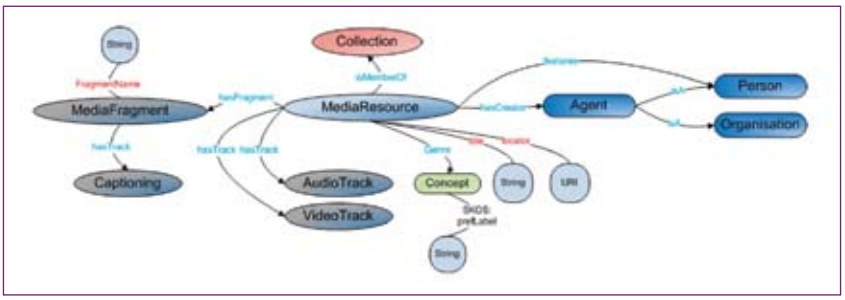

Figure 5: Example of RDF representation with fragments

5.4 **Enhancements and Enrichments** The 'Flat' models can be represented in semantic databases without changing them but by giving them access through semantic searches: that process is called '**enhancement**'. In turn, they can be enriched (as said in the News example) by structuring, finding and creating LODs, by transcriptions, translations, synchronisations and other '**enrichments**'.

A typical example of such a process has been implemented by Memnon Archiving Services in its IPI-Solutions cluster of functions plugged-in to its semantic database ISIS.

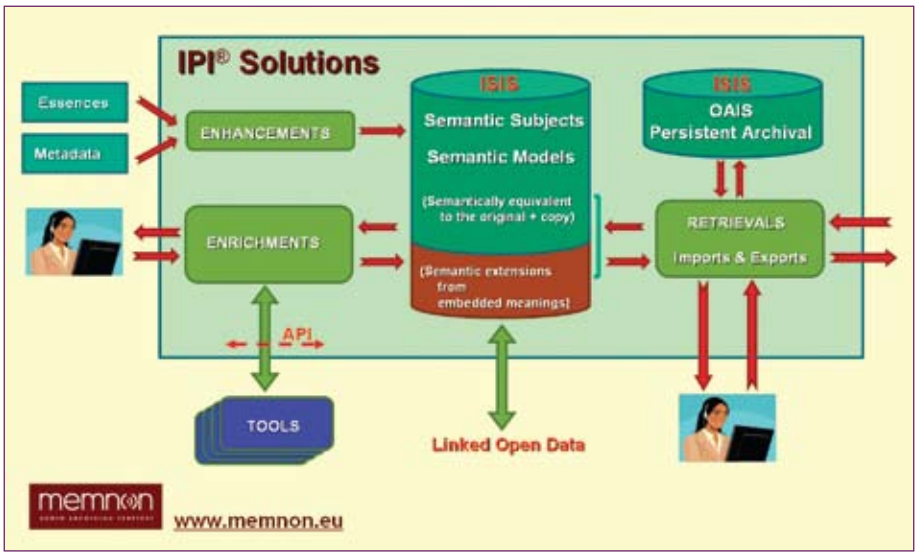

Figure 6: Example of a 'Semantic system' with enhancements and enrichments

5.5 **Configuration and Rights management of the assets** The management of the existence, states and stages of the assets of their archival, exchanges, sharings, destructions, releases and similar, can be implemented using the semantic approach. A Conceptual Reference Model for Configuration and Rights management is currently being finalised under the acronym: AXIS-CRM.

Acknowledgements

The authors would like to thank Jean-Pierre Evain [evain@ebu.ch] and Tobias Bürger [tobias.buerger@gmail.com] who gave them the authorisation to include excerpts of their paper, 'Semantic Web, linked data and broadcasting' in *EBU Technical Review – 2011 Q1*. It concerns the section 4 and figure 5.

They would like also to thank Roger Roberts [rro@rtbf.be president of the non-profit association TITAN] and Michel Merten [michel.merten@memnon.eu CEO of Memnon Archiving Services] for their continuous involvement and commitment to the research and implementation of products and services suitable for producing 'native semantic' contents and for 'persistent archiving' in a semantic context.

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Useful links

Video http://www.ted.com/talks/tim_berners_lee_on_the_next_web.html

Linked Data Principles http://www.w3.org/DesignIssues/LinkedData.html

http://www.w3.org/2008/WebVideo/Annotations

http://www.w3.org/TR/2010/WD-mediaont-10-20100608/

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PUBLISHING EUROPE'S TELEVISION HERITAGE ON THE WEB: THE EUSCREEN PROJECT

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1. Introduction

The EUscreen project represents the European television archives and acts as a domain aggregator for Europeana, Europe's digital library. The main motivation for it is to provide *unified access* to a representative collection of television programs, secondary sources and articles, and in this way to allow students, scholars and the general public to study the history of television in its wider context. The main goals of EUscreen are to (i) develop a state-of-the-art workflow for content ingestion, (ii) define content selection and IPR management methodology, and (iii) provide a front-end that accommodates requirements from several user groups.

Providing access to large integrated digital collections of cultural heritage objects is a challenging task. Multiple initiatives exist in different domains. For example, Europeana[1] manages a state-of-the art technical infrastructure to manage the ingestion and management of data from a wide variety of content providers. It aims to give access to Europe's entire digitised cultural heritage by 2025. Europeana focuses on two main tasks (i) to act as a central index, aggregating and harmonising metadata following a common data model (Isaac, 2010) and (ii) to provide persistent links to content hosted by trusted sources. The portal currently provides access to 15 million objects, primarily books and photographs; audiovisual collections are underrepresented. However, recent analysis of query logs from the Europeana portal indicated users have a special interest in this type of content.

Television content is regarded a vital component of Europe's heritage, collective memory and identity — all our yesterdays — but it remains difficult to access. Even more than with the museum and library collections, the dealing with copyrights, encoding standards, costs for digitization and storage makes the process of its aggregated and contextualized publishing on the Web extra challenging.

2. Context and motivation

The main motivation for our work is to overcome the current barriers and provide *unified access* to a representative collection of television programs, secondary sources and articles, to allow access to students, scholars and the general public. The multidisciplinary nature of the EUscreen project is mirrored in the composition of the socio-technical nature of the consortium; comprising 20 collection owners plus technical enablers, legal experts, educational technologists and media historians of 20 countries. EUscreen represents all major European television archives and acts as one of the key domain aggregators providing content to Europeana.

Several public reports on our work can be downloaded from the project blog[2]. This paper reports on the results of the work performed over the past one and a half years, leading up to the launch of the first version of the portal. Notably, we zoom in on the interplay between user requirements, technical possibilities and societal issues, including intellectual property rights. We will show how EUscreen contributes to a so-called 'Cultural Commonwealth' (American Council of Learned Societies Commission on Cyberinfrastructure, 2006) that emerges by bringing content from memory institutions and the knowledge of its heterogeneous constituency together.

Conceptually, EUscreen is built on the notion that knowledge is created through conversation

1 http://www.europeana.eu
2 http://www.euscreen.eu

(Scott, 2001). Hence, ample attention is given to investigating how to stimulate and capture knowledge of its users. Combining organizational, expert and amateur contributions is a very timely topic in the heritage domain, requiring investigation of the technical, organizational and legal specificities. The success of EUscreen inherently depends on the adaptation of an approach that takes the full scope of these factors into consideration.

3. EUscreen: television on the web

The main goals of EUscreen are to (i) develop a state-of-the-art workflow for content ingestion, (ii) define content selection and IPR management methodology (35,000 items will be made available), and (iii) provide a front-end that accommodates requirements from several user groups.

To reach these goals, close cooperation between the different stakeholders in the consortium is essential. For example, the selection policy needs to take in to account the available content, wishes from media historians and the copyright situation. The workflow will need to study the existing metadata structures, should support aggregation by Europeana and provide support for multilingual access.

3.1. Content ingestion workflow

The technical standards enabling *interoperability* form an important dimension of the technical achievements. In order to achieve semantic interoperability, a common automatic interpretation of the meaning of the exchanged information is needed, i.e. the ability to automatically process the information in a machine-understandable manner. The first step of achieving a certain level of common understanding is a representation language that exchanges the formal semantics of the information. Then, systems that understand these semantics can process the information and provide web services like searching and retrieval.

Many different metadata schemas, or, in a broader sense, sets of elements of information about resources, are being used in this domain, across a variety of technical environments and scientific disciplines. EUscreen has developed an ingestion mechanism providing a user friendly environment that allows for the extraction and presentation of all relevant and statistical information concerning input metadata together with an intuitive mapping service that uses the EUscreen Metadata schema, and provides all the functionality and documentation required for the providers to define their crosswalks. The workflow (See Figure 1) consists of four phases, each responsible for specific services to ensure the quality of the ingestion process:

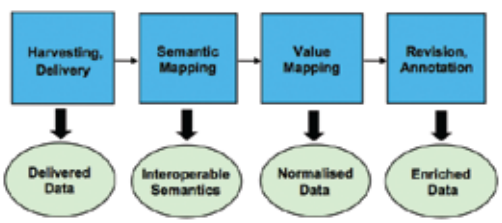

Figure 1. Content ingestion workflow

In order to achieve semantic interoperability with external web applications, EUscreen metadata are exported in EBUcore (Evain, 2009), which is an established standard in the area of audiovisual metadata. The metadata is stored in RDF format to improve the search functionality and enable the alignment with external resources. Finally, EUscreen has created a SKOS multilingual thesaurus (15 languages) based on the subject terms of the IPTC standard [International Press Telecommunications Council http://www.iptc.org/site/Home/] and the geographical places of GeoNames (http://www.geonames.org/). The thesaurus supports multilingual retrieval services and links to open data resources that could

be used for enrichment and to contextualise the collection.

3.2. Content selection

A totally different challenge is the selection of a core collection of 35,000 objects from these vast collections. In collaboration with leading television historians EUscreen has defined a content selection policy, divided into three strands:

1. *Historical Topics:* 14 important topics in the history of Europe in the 20th Century (70% of content);
2. *Comparative Virtual Exhibitions:* two specially devised topics that explore more specialised aspects of European history in a more comparative manner (10% of content — include documents, stills, articles);
3. *Content Provider Virtual Exhibitions:* each content provider selects content supported with other digital materials and textual information on subjects or topics of their own choosing (20 % of content).

3.3. Front-end

Representatives of the four primary user groups, e.g. secondary education, academic research, the general public and the cultural heritage domain were consulted in order to define user requirements (Tzouvaras, 2010). The main challenge for the portal's front-end is to include advanced features for specific use cases without overwhelming the users with a complex interface. The Helsinki University of Arts and Design adapted a component-based conceptual model that accommodates this requirement (See Figure 2).

Figure 2. Homepage design

The Web platform also includes interactive web-based features, such as the creation of so-

called virtual exhibits and playlists that assists the users to appropriate this rich resource in a meaningful way.

4. Future work

The first version of the portal was launched in March 2011, which is being followed by a period of extensive evaluations with end-users. Also, the selection policy will be reviewed. Outcomes of this process will form the basis of the design of the second release, scheduled for early 2012. We anticipate that the participatory features of the portal will be extended and we can further enhance the portal creating additional links to datasets in Linked Data format.

Acknowledgements

EUscreen is co-funded by the European Commission within the eContentplus Programme.

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'WHAT WE BELIEVE WE ARE, SAY WE ARE AND DEMONSTRATE WE ARE': A QUANTITATIVE ANALYSIS OF THE ATTITUDES OF AUDIOVISUAL ARCHIVISTS

Tim Bathgate, Radio New Zealand Sound Archives / Nga Taonga Korero

1. Introduction

The tradition of archiving audiovisual resources as memoirs of the activities of human beings (and, indeed, non-human beings) has been co-ordinated and carried out continuously for over 100 years. Like its professional cousins — librarianship, museology, and archival science — audiovisual archiving is a specialist occupation that aids our civilisation by systematically collecting, preserving, and providing access to academic and cultural resources.

The long history that audiovisual archiving enjoys seems reason enough to suggest that it is, in some sense, a social necessity, and worthy — a priori — of an elevated social standing. Nevertheless, for almost 30 years, discussion as to whether the sector should be held in such regard has been relatively commonplace, with most believing that audiovisual archivists are worthy of a professional status.

What is yet to be thoroughly examined is whether or not there is any validity to the popular claim to professionalisation. As any observer of the established professions will recognise, professionalisation tends to be closely linked with money, power and prestige, so it is not surprising that any occupational group that feels underpaid or underappreciated should set its sights on such a goal.

2. Outline

2.1. Rationale and purpose

Theorists in the field of audiovisual archiving have often made the argument (which is usually based on weak, enumerative induction) that audiovisual archivists embody the intangible, attitudinal assets that are necessary to achieve professional status. It is claimed, though, that audiovisual archivists are restrained by a lack of accreditation programmes and opportunities for formal training — two traits that are commonly thought of as prerequisites for professionalisation.

We should find these sophistic claims to professionalisation slightly unnerving: it seems sensible to assume that, without understanding the attitudinal 'genetics' of the workforce, it simply cannot be proven that professionalisation is appropriate, or even attainable, for audiovisual archivists.

This study aims to take preliminary steps towards determining whether audiovisual archivists carry out their work as 'unrecognised professionals', or as non-professionals who are forced, by the nature of their work, to adopt a subset of professional traits. It is expected that this glimpse will aid the audiovisual archiving community in developing an understanding of its entitlements by highlighting the virtues and deficiencies in the attitudes and perceptions of the existing populace, and answer the question of whether or not professionalisation might be achieved given the orientation of the existing workforce.

2.2. Research questions

2.2.1. General orientation of audiovisual archivists

This study attempts to outline the attitudes and perceptions that contribute to, or detract from, the professional calibre of audiovisual archivists. In more concrete terms, it asks 'to what extent do practitioners in the audiovisual archiving sector perceive themselves as being professional'? The answer to this question should establish the general, or 'mean', attitude of the sec-

tor's practitioners, and highlight the existence, and the breadth, of any attitudinal shortcomings that might rob audiovisual archivists of their desired status.

It is expected, based on the conjectures of theorists in our field, that audiovisual archivists are, indeed, professionalising, but are predominantly impeded by a general lack of belief in their work. The study adopts this assertion as its primary hypothesis.

2.2.2. Exhibition of professional attitudes across strata

Given that this study will be carried out under the assumption that, at best, audiovisual archivists are professionalising, rather than working as 'unrecognised professionals', it is clear that the utility of the study would be greatly improved by asking whether attitudes change when common variables amongst the sample are accounted for. That is to say, 'when the subjects of the study are stratified by a common trait, and studied as a subset of the overall sample, can a distinction in attitude or perception be observed in the subset when compared with its compliment'?

This line of questioning aims to test the conjecture that the audiovisual archiving workforce is mostly heterogeneous in its attitudes, perceptions and principles by looking for evidence of uniformity (which would falsify the theory) or non-uniformity (which would corroborate it).

The suggestion that the attitudes, perceptions and principles of the workforce are heterogeneous is taken as the study's second hypothesis.

3. Research design

3.1. Research sample

The sample for this study was drawn from the Association of Moving Image Archivists (AMIA) and the International Association of Sound and Audiovisual Archives (IASA). More specifically, the study only targeted those institutions that had listed a contact e-mail address in the 2006 IASA and Winter 2009 AMIA member directories. These groups were targeted because, collectively, they represent the major film and sound archives that comprise the audiovisual archiving sector, and their membership was found to be more comprehensive than other organizations, such as the Association for Recorded Sound Collections (ARSC), et al.

Of the 214 institutions that had listed a contact e-mail address, a sample of 160 was selected at random and single employee was asked to participate. To refrain from undermining the randomness of selection, the e-mail that was sent to each of these institutions asked the recipient to pass the invitation on to a colleague whose last name followed theirs, alphabetically, in the staff list.

It was expected that the response rate for this study would be approximately 60-70%, which would have yielded 120-140 responses.

3.2. Data collection

Invitees were linked to an online survey hosted by Qualtrics on a sub-domain reserved for Victoria University of Wellington (vuw.qualtrics.com). It was expected that the manner in which the survey was hosted — that is, clearly affiliated with the University — would lend an air of legitimacy to the study that could not have been achieved were the University's involvement not overtly visible.

Although online surveys are thought to exclude potential respondents that do not have Internet access (Bryman, 2008, p. 653), it was unofficially revealed at the 2009 IASA Annual Conference that all members of IASA are contactable via e-mail and it has been presumed, by extension, that members must all have Internet access. It seemed likely that this would be true for members of the other associations.

Regardless of the data collection method, it was certain that a survey would inadvertently exclude potential respondents that were unable to speak English. However, it was expected that the institutions that were registered with IASA and AMIA were likely to have some multilingual staff members, given that these associations primarily produce their publications in English.

3.3. Research instrument

To answer the research questions, an instrument designed by Hall (1968) and amended by Snizek (1972) was repurposed to support the study. The instrument asks 25 questions (see Tables 4-8, below), which are presented as a Likert scale. The constituent Likert items are arranged into five 'theoretical dimensions of professionalism' (Snizek, 1972, pp. 109-110): 'using the professional organisation as a major referent', 'belief in public service', 'belief in self regulation', 'sense of calling to the field', and 'autonomy'. It is especially important to recognise — as becomes clearer upon reading through the questions — that the instrument measures the degree to which a subject perceives themselves and their colleagues as exhibiting professional tendencies. It is not a 'personality test' of sorts; that is, it does not evaluate a subject's professionalism, rather, it measures the degree to which they perceive themselves as being professionals.

Although the instrument is suitably agnostic, it was modified somewhat to ensure clarity and applicability to the audiovisual archiving community. These modifications were minor syntactic changes, rather than major semantic alterations.

Three major benefits to choosing the Hall-Snizek instrument for this study were identified. Firstly, the instrument was designed as a means of comparing multiple occupational groups with one another to determine the proximity of those occupations to one another. Therefore, it seemed plausible that the results from this study could be compared with the results of studies in other fields. For example, the professional orientation of audiovisual archivists could be compared to other information professions (if they have been surveyed). An informal analysis of citations using Google Scholar shows that this instrument has been used extensively to study other occupational groups.

The second advantage of using this instrument, rather than designing one specifically for examining audiovisual archivists, was that it could potentially be applied in future studies to facilitate a longitudinal analysis of the changing attitudes of audiovisual archivists. If an instrument were designed with the express purpose of examining present-day audiovisual archivists, it could not predict how the field might evolve and would, therefore, be unlikely to retain its relevance as the field changes.

Finally, Snizek's (1972) reassessment of the instrument introduces a degree of reliability and brevity. It seemed likely that, given the refinement and widespread use of this instrument, the study would yield data with suitable internal reliability and relevance to the main research questions.

3.4. Identification of variables

One goal of this study is to identify generative mechanisms that affect the professional attitudes of audiovisual archivists. It has been recognised, both from the literature and involvement in the field, that there exists an array of variables that could cause professional attitudes to fluctuate.

The following variables were chosen either because of their relationship with professional development (i.e. subjects who have been 'professionally developed' should be more confident in their status than those who are not) or because they are represented in the audiovisual archiving literature as having some relevance to the professionalisation of audiovisual archivists.

Independent Variable	Example	Purpose
Geographical Location	Europe, North America, Asia	There is informal evidence that suggests that there are vast cultural differences in the evaluation and undertaking of audio-visual archiving across the world
Institution Size	1-5 (people working in the audio-visual section of the archive)	To explore whether professional orientation is affected by the size of a subject's peer group
Institution Type	National Library	To explore whether professional orientation is affected by organisational goals or culture
Position	Manager	To explore whether professional orientation is affected by the nature of a subject's work
Relevant Qualification	Yes/No	To explore whether formal education in a related discipline (e. g. librarianship, audio engineering, etc.) affects professional orientation
Training	Yes/No	To explore whether training (i.e. the imparting of skills from one practitioner to another) affects professional orientation
Years of Experience	1-3 Years	To explore whether practitioners become more professionally orientated over time

Table 1 - Independent variables: examples and rationale

3.5. Data analysis

Data was analysed using PASW Statistics 17.0. Data was exported directly from the Qualtrics website and imported into SPSS for analysis.

The 25 Likert items were coded from one to five and these values were treated as ordinal data. It was decided that the data should be treated as ordinal, rather than ratio-level data as it was conceded that the scale was discontinuous; that is, it is valid to suggest that Strongly Agree is a greater value than Agree, however, it is not valid to suggest that there is any continuity between each of the five values.

Given that the responses were treated as ordinal-level data, it was in accordance with common principles of analysis to calculate the median and mode for each Likert item.

When measuring the effect of the independent variables on professional attitudes, the median values returned for the Likert items that corresponded to each theoretical dimension of professionalism were summed to generate five average attitudinal values; each value represents the degree to which a subject was aligned with each dimension of professionalism. The subjects that presented with a common independent variable were grouped and the appropriate bivariate analysis was performed to test for a relationship. These analyses are summarised in the following table:

Independent Variable	Variable Type	Bivariate Analysis
Geographical Location	Nominal	Compare means and eta
Institution Size	Ordinal	Spearman's rho
Institution Type	Nominal	Compare means and eta
Position	Nominal	Compare means and eta
Qualifications Held	Dichotomous	Compare means and eta
Training	Dichotomous	Compare means and eta
Years of Experience	Ratio	Spearman's rho

Table 2 - Independent variables: data types and proposed analyses

4. Results

4.1. Response

The rate of response for the survey was exceptionally low. Of the 160 institutions that were invited to participate, only 22 respondents completed the survey — a response rate of 13.75%.

Of the 138 institutions that did not participate, 29 were precluded from participating due to an e-mail delivery failure (i.e. the published e-mail address was no longer valid), and seven could not be reached because the employees that would have been monitoring the targeted inbox were not available (i.e. an 'out of office' auto-reply was returned).

The low response rate has significant implications for the impact of the study. It will be impossible to make any inferences about the population, and any findings will be extremely limited in scope; that is, all findings are an exposition of the 22 respondents, and can extend no further than that.

4.2. Reliability

Cronbach's Alpha was calculated for each of the five Likert scales to determine the internal reliability of each of the Likert scales — that is, to what extent the individual Likert items for each of the five dimensions were coherent with one another.

	Using the professional organisation as a major referent	Belief in public service	Belief in self-regulation	Sense of calling to the field	Autonomy
Cronbach's Alpha	0.642	0.544	0.775	0.674	0.504

Table 3 - Reliability for each Likert scale

The table shows a suitable degree of coherence between the Likert items in each scale, with the items in the scale that test for belief in self-regulation as the most coherent, and those items designed to measure autonomy as the least coherent.

4.3. Significant data

4.3.1. Measures of central tendency

The measures of central tendency are reported here for each of the Likert items. Though cumbersome, the aggregated results of each Likert item are presented in the interests of demonstrating the internal deviations from the overall results of the Likert scale (see Table 9), some of which are quite revealing.

The Likert items have been grouped according to the Likert scale to which they belong. Also note that those questions that are marked with an asterisk have been phrased in the negative — in these cases, a high score is a positive result (i.e. it implies disagreement), whereas a low score is negative.

	Median	Mode
I systematically read the AMIA and/or IASA journals	4	4
I regularly attend conferences related to audiovisual archiving	4	4
I believe that IASA and/or AMIA should be supported	4.5	4
The professional organisation (e. g. IASA or AMIA) doesn't really do too much for the average member*	4	4
Although I would like to, I don't really read the IASA and/or AMIA journals too often	3.5	4

Table 4 - Using the professional organisation as a major referent

	Median	Mode
Other professions are more vital to society than audiovisual archiving*	2	2
I think that the audiovisual archiving profession, more than any other, is essential for society	2.5	2
The importance of audiovisual archiving is sometimes over stressed*	4	4
Some other occupations are actually more important to society than audiovisual archiving*	2	2
If ever an occupation is indispensible, it is audiovisual archiving	3	4

Table 5 - Belief in public service

	Median	Mode
My colleagues have a pretty good idea about each others' competence	4	4
A problem in the field of audiovisual archiving is that no one really knows what their colleagues are doing*	3	4
My colleagues and I are aware of how well each of us do our jobs	4	4
My colleagues and I really have no way of judging each others' competence*	3.5	4
There is not much opportunity to judge how another audio-visual archivist carries out their work*	3	4

Table 6 - Belief in self-regulation

	Median	Mode
Audiovisual archivists have a real 'calling' for their work	4	4
The dedication of people in the field of audiovisual archiving is most gratifying	4	4
It is encouraging to see the high level of idealism that is maintained by audiovisual archivists	4	4
Most people would continue to work as audiovisual archivists, even if their incomes were reduced	3.5	4
There are very few audiovisual archivists who don't really believe in the value of their work	4	4

Table 7 - Sense of calling to the field

	Median	Mode
I make my own decisions in regard to what is to be done in my work	3	2
I don't have much opportunity to exercise my own judgement*	4	4
I am my own boss in almost every work-related situation	3	2
My own decisions are subject to review*	2	2
Most of my decisions are reviewed by other people*	2	2

Table 8 - Autonomy

4.4. General profile

The following table has been produced by taking the responses of each participant and calculating their median response for each of the five Likert scales; then summing these scores and dividing by the total number of responses.

A decimal representation of these statistics has also been produced by dividing the mean response to each dimension by five to demonstrate the strength of the orientation in each dimension on a scale from 0.0 to 1.0, as has been done in similar studies.

	Using the Public Organisation as a Major Referent	Belief in Public Service	Belief in Self-Regulation	Sense of Calling to the Field	Autonomy
Mean Response	4	2.7	3.5	3.9	2.8
Decimal Representation	0.8	0.54	0.7	0.78	0.56

Table 9 - Summed scores for each of the five dimensions of professionalism

The mean response shows that respondents, generally, exhibited a tendency to use the professional organisation as a major referent. As Table 4 shows, there was particularly strong agreement, with little deviation between respondents, that IASA and AMIA were deserving of support (whether political, financial, etc. left to the respondent to decide).

The degree to which respondents believe that audiovisual archiving is a 'public service' is low, but not drastically low. Table 5 shows that the responses to the constituent items is mixed, but lean towards a lack of confidence in the utility of audiovisual archiving for the general populace. In particular, confidence is especially low wherever audiovisual archiving is compared to other professions.

When questioned on self-regulation, respondents leaned towards agreement with the notion that audiovisual archivists are able to judge the competence of their colleagues. Nevertheless, respondents seemed indifferent as to whether or not such a regulatory mechanism was needed.

There was consistent agreement with all items measuring sense of calling to the field.

Responses to the items that aim to measure autonomy were mixed. The data seems to suggest that the concept of autonomy as enforced by the instrument is not appropriate in this instance. As is evident from Table 8, items that ask after a respondent's degree of autonomy in carrying out their assigned task typically received neutral responses, or agreement. Conversely, there was little agreement with the notion that autonomy extends beyond the bounds of a given task (i.e. some autonomy is absolved by 'higher-ups').

4.5. Bivariate analysis

Bivariate analysis was carried out for experience, institution size, qualifications, institution type, role and continent using the statistical tests outlined in section 3.5.

Bivariate analysis was not carried out to determine whether any correlation existed between participation in training programmes and professional orientation as it was deemed that the sample was not suitably diverse to generate any useful results.

This analysis resulted in two noteworthy observations. Firstly, the analysis revealed a statistically significant, positive correlation between institution size and sense of calling to the field at the 0.05 level. That is, it was observed that, as institution size increases, so too does agreement with the Likert items that measure sense of calling to the field.

Secondly, an Eta test showed that there was a moderately strong relationship between the type of institution to which a respondent belongs and both their sense of calling to the field and their autonomy.

5. Discussion

5.1. Response rate

The cause of the study's disappointing response rate is not immediately obvious, though it is clear that language and technology were both barriers. It would be reasonable to expect that, were the survey repeated using a current membership directory, and were the survey available in multiple languages, this might have enabled more people to respond.

Nevertheless, there is evidence to suggest that low response rates to surveys involving the audiovisual archiving community are not uncommon. Another researcher in this field encountered a similarly poor rate of response when surveying members of ARSC and IASA using an online survey (personal communication with Aaron Rosenblum, 2010).

Conversely, funded studies of the community have yielded many hundreds of responses (Training for Audiovisual Preservation Europe, 2008). This is not to suggest that there is a causal connection between the 'status' of the study and its response rate, but this shows that it is indeed possible to conduct a successful survey of the audiovisual archiving community.

Given that the progression of the sector relies, in part, on understanding the genetics of the sector, surveying is obviously an important activity. However, a rash of low response rates are likely to act as a disincentive for researchers. It seems important to ascertain whether low response rates really are common in the audiovisual archiving community, and how this might be ameliorated[3].

5.2. Hall-Snizek instrument

The results of Cronbach's Alpha seem to suggest that some Likert Scales in the Hall-Snizek instrument are more appropriate for studying the audiovisual archiving community than others. In particular, the instrument does not necessarily acknowledge the bureaucratic structure of most institutions. That is to say, the instrument is designed to survey practitioners, such as doctors, that generally do not answer to a 'boss'.

The data in Table 8 shows that, in day-to-day activities, audiovisual archivists believe that they are afforded a measure of autonomy. Nevertheless, the two items that ask whether a subject's decisions are subject to review confuse the amalgamated result. That is, when a subject is forced to acknowledge their position in a hierarchy, the autonomy afforded to them in their day-to-day work is nullified in the amalgamated result.

As such, a reworking of the instrument might consider modifying these two questions to qualify the *kinds* of decisions that are subject to review. That is, is it the practitioner's application of their specialist knowledge that is subject to review, or is it the peripheral decisions regarding allocation of resources, etc. that come under review.

5.3. Hall-Snizek results

5.3.1. Using the professional organisation as a major referent

The high level of agreement in this dimension is not surprising — it is difficult to imagine how a practitioner in such a small sector could survive without the information and support that streams from the professional organisations. In particular, best practice guides, such as IASA's TC-04 tend to be lauded by the audiovisual archiving community.

3 It is worth noting here that, following the presentation of this research at the 2010 IASA Conference in Philadelphia, it was revealed that many institutions are inundated with requests to participate in surveys. Any attempt to improve research in our field will have to address this issue.

5.3.2. Belief in public service

The responses to those items that measure a respondent's belief that audiovisual archiving is a public service were relatively, though not drastically, negative. This was predicted both by Linstow (1992) and Hubert (1992).

This observation is something of a concern. It was predicted by theorists in the field of audiovisual archiving that lack of belief in the work stemmed from an 'identity crisis', and that this prevented the progression of the field. At a more local level, this tendency is concerning as it must surely impact the degree to which an individual is able to derive satisfaction and identity from their work.

Two potential causes for the low score in this dimension come to mind. Firstly, the nature of the work can be somewhat solitary. In larger archives, at least, it is common for the archive's clientele to interact with an employee whose sole responsibility is to satisfy client requests. As such, the interface between many archivists and the end-user is non-existent. Contrasted with medicine, for example, the nature of the doctor-patient relationship lends the practitioner the opportunity to directly witness the good that results from their work.

Studying those employees that act as an interface between the archive and end-users could offer insight into whether the divide between the solitary archivist and the user affects the archivist's perception of the value of their work.

A second cause could be the ambiguous nature of the questions — the Likert items put the respondent into a position where they are forced to compare audiovisual archiving with every imaginable profession. Rather than asking for a response to a narrow statement such as 'Audiovisual archiving is more important to society than accountancy', the instrument confronts participants with dauntingly broad statements — 'Other professions are more vital to society than audiovisual archiving'. Such questions invite the respondent to consider the universe of professions and defend the importance of theirs against all others, which could shake the respondent's confidence.

In addition, the Likert items fail to acknowledge that all public services have their own unique limitations. For instance, the services that a doctor is able to offer to the public are limited to healing; an accountant to financial advice; and a teacher to education. Were the questions rephrased to acknowledge these limitations, we might expect better results. For instance, were audiovisual archivists asked whether the value of their services to researchers resembles the value that a doctor's services represent to the sick, it seems likely that a respondent might imagine a scenario in which their service as an audiovisual archivist was able to rescue a desperate researcher, thereby inspiring greater confidence in the importance of their work.

5.3.3. Belief in self-regulation

Respondents tended to exhibit a reasonable degree of confidence that they have a means to judge their competence and the competence of their colleagues. There is little evidence in the audiovisual archiving literature to suggest why such an attitude might exist.

5.3.4. Sense of calling to the field

The tendency for respondents to indicate that audiovisual archivists experience a sense of calling to the field echoes the general beliefs of the authors that were encountered during the literature review — it is generally recognised that audiovisual archivists exhibit a unique, inexplicable affinity with their work.

Given that this otherwise hypothetical property has presented itself during the course of this research, it seems reasonable that this property should be investigated further. As the workforce morphs and new archivists are recruited, knowledge of the tendencies that make

for 'good archivists' could very well aid the recruitment process and ensure that the 'sense of calling' — and any benefits that piggy-back on this quality — is maintained through each iteration of the workforce.

5.3.5. Autonomy

As with belief in public service, respondents did not test well for autonomy. Again, the nature of the questions might have influenced the result, given that the questions did not adequately reflect the power hierarchies of bureaucratic organisations.

It is difficult to envision the implications of insufficient autonomy. For instance, is it at all appropriate that the audiovisual archivists that formed this sample are required to have their decisions reviewed? Is this the most efficient, effective means of running an audiovisual archive? How might the introduction of technologies that diminish the need for decision-making on the part of the individual (computer-aided quality assurance, for instance) affect other dimensions, such as sense of calling?

Personal communication with archivists on this topic suggests that, at the level of the individual, bureaucratic structures and lack of autonomy are not conducive to effectiveness or job satisfaction. It seems extremely important that the issue of autonomy is researched in much greater depth.

5.4. Discussion of bivariate analysis

5.4.1. Institution size and sense of calling

A statistically significant correlation between the size of an institution and a practitioner's sense of calling to the field was observed. This suggests that sense of calling might bear some relationship with the size of a social group and the interactions within that group.

Given the highly specialised nature of the work, the presence of like-minded colleagues is probably a source of enjoyment. Moreover, it seems possible that a confirmation bias might cause this orientation; that is, a practitioner witnesses their peers working positively towards a shared goal and finds validation in this.

Whatever the reason, if this discovery is corroborated in a large-scale study, it seems important that the benefits that arise due to institution size must be replicated somehow. That is, the benefits of being surrounded by one's peers must be afforded to those archivists that work in relative isolation. Future investigation should examine whether physically isolated archivists that participate regularly in virtual social environments (such as listservs) feel a similar sense of calling. If it were found that sense of calling is related to connectedness, steps could be taken to connect archivists that are separated by institutional or geographical borders.

5.4.2. Observation of non-correlations

It is important to note the relationships that were shown not to exist in the sample. Of these, the non-correlation[4] between the possession of relevant qualifications and professionalism is the most important. Currently, the advocacy for professionalisation by way of education and accreditation seems especially prominent (Co-ordinating Council of Audiovisual Archives Associations, 2006). If the findings of this study were to hold for a more comprehensive sample, it would be fallacious to expect that education alone could cause audiovisual archivists to professionalise.

4 Note, I am not referring here to a negative correlation

If the holding of relevant qualifications is as inert, in terms of improving professional orientation, in the population as it is in this sample, it seems that any curriculum for training audiovisual archivists must include strategies for instilling a belief in the value of the work in the programme's graduates and conveying a set of skills that predispose the graduate to a suitably autonomous position.

5.5. Research questions

5.5.1. General attitudes of audiovisual archivists

As hypothesised, the audiovisual archivists sampled, generally, did not score highly in all of the theoretical dimensions of professionalism. In particular, their belief in their work as a public service was lacking. Were the sample suitably large, it would be reasonable to suggest that it is currently inappropriate to consider audiovisual archiving a profession, and that this shortcoming is largely due to a so-called 'image crisis'.

Though the sample is so small as to have rendered all results from this study inconclusive, it is worth noting that the study is probably larger and more systematic than any previous attempt to characterise the community. As such, it is the strongest corroboration to date of the theorising of Edmondson, et al.

5.5.2. Variance of professional attitudes across strata

It was believed that professional attitudes and perceptions would vary across strata. As predicted, it was found that, in this sample, audiovisual archivists working in larger organisations tended to experience a greater sense of calling to the field.

This study only tested a small set of subgroups, which were derived via educated guessing. It seems likely that there are other subsets of the audiovisual archiving community whose professional orientation differs significantly from the overall population.

This study hints at the heterogeneity of attitudes in the field, which is in corroboration with the assertions of theorists.

5.6. Implications

It has been stressed that no new knowledge about the population can be derived from this study. However, there are a series of peripheral implications that have come to light during the course of this research.

The most significant of these, and that which demands the most urgent attention, is the extreme difficulty that was encountered in carrying out research in conjunction with the audiovisual archiving community.

Firstly, IASA would do well to publish its membership directories more frequently. The transitory nature of e-mail addresses and staff guarantees that a high proportion of e-mail addresses listed in a membership directory will not be available towards the tail end of the four-year publication cycle. Efforts must also be made to encourage members to engage with researchers; participating in research should be seen and experienced as a morally enriching activity, rather than an assault on one's time and intellect.

A second major implication that deserves attention, for this sample at least, is that of the disappointing score in the dimension that characterises belief in the value that one's work has to the public. Research is obviously required, but simple ways to expose archivists to the public good that their work is responsible for should be explored.

5.7. Extensions

The most obvious extension to this project is to repeat it, using the findings of this study as a guide. Targeting a different group — ARSC and FIAF for instance — and getting support from the professional organisations could counteract the poor response. The survey should also be multilingual.

As has already been hinted at, there is scope for investigating each of the five dimensions individually. Most importantly, there is a great deal to be learned about *why* audiovisual archivists lack a belief in the value of their work to the public. A less pressing concern is the effectiveness of existing organisational structures as a means of managing audiovisual archiving institutions; the distribution of autonomy, in particular, is worthy of investigation.

Finally, discussion on how to optimise the relationship between researchers, the population, and the professional organisations is sorely needed. Ideally, the research process in this field should have guidelines.

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DEVELOPING AN MXF AUDIOVISUAL PRESERVATION FILE WRAPPER SPECIFICATION IN THE FEDERAL AGENCIES DIGITIZATION GUIDELINES INITIATIVE

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This paper is based on a presentation made at the IASA/AMIA 2010 joint conference in Philadelphia, November 4, 2010.

Introduction

This paper describes a project to develop a file-wrapper specification for the archiving and preservation of audiovisual content. The specification under development is an implementation of the Material eXchange Format (MXF), a standard from the Society of Motion Picture and Television Engineers (SMPTE). The initial phases of this effort have been organized by the Audio-Visual Working Group of the U.S. Federal Agencies Digitization Guidelines Initiative.

MXF can contain various encoded moving image bitstreams, e.g., MPEG-2, JPEG 2000 frame images, uncompressed video streams, and many more, as well as soundtracks, time-code, closed captioning, metadata, and more. This wrapper function may be compared to the TIFF and WAVE file formats, both of which may contain a number of different representations of raster image data (TIFF) or sound waveform data (WAVE). The virtues of MXF include standardization by SMPTE, a robust structure for the containment of various related essences, and a clear mission to support professionally produced moving image content. It is also the case that the format is complex and that its adoption within the industry has been slow, albeit steady.[5]

The Federal Agencies Digitization Guidelines Initiative was launched in 2007 under the auspices of the National Digital Information Infrastructure and Preservation Program (NDIIPP) at the Library of Congress.[6] The overall initiative is a collaborative effort with participation from more than one dozen U.S. government agencies, including the National Archives and Records Administration, the National Gallery of Art, the Voice of America, the National Library of Medicine, the Smithsonian Institution, and several others. It also has active participation from the Library of Congress Audio-Visual Conservation Center at the Packard Campus in Culpeper, Virginia.

Current activities and planning

The Working Group was motivated to develop an MXF archiving and preservation implementation because several member agencies face a pressing need to reformat videotapes. These agencies have extensive holdings of obsolescent magnetic recordings and wish to transfer them to a file-based format. At this time, three members of the Working Group are doing some digital reformatting of video. They have purchased SAMMA devices, a product of the Front Porch Digital company.[7] The Library of Congress has done the most work thus far, while the U.S. National Archives and Records Administration and the Smithsonian Institution are starting to carry out projects of their own.

5 For more information see, the background paper here: http://www.digitizationguidelines.gov/guidelines/FADGI-AV_AppSpecProj_Bkgd_101007.pdf

6 he initiative's goal is to develop guidelines that are comparable from agency to agency, for the sake of uniformity and to make it easier for the vendors who provide equipment and services. The main emphasis is digitization, i.e., the conversion of analog originals into digital form. There are two working groups. The first is concerned with the still images that result from the scanning of books, photographs, manuscripts, maps, two-dimensional art works, and other documents. The second is concerned with audio-visual materials, i.e., sound and video recordings and motion picture film. Both groups have a secondary interest in the preservation of born digital content. See http://www.digitizationguidelines.gov/.

7 http://www.fpdigital.com/Solutions/Migrate/

SAMMA devices can be set up for a number of different output formats. The Library is using SAMMA's best-known setup in a workflow that produces a stream of video-frame images, each encoded in lossless JPEG 2000. This picture data, together with the soundtrack and timecode, is wrapped in MXF. Files in this format serve as archival masters for preservation in the moving image collections at the Packard Campus. File sizes for standard definition video run from 25 to 50 gigabytes per hour, depending on variables like bit depth. The Library prefers 10-bit-deep sampling and thus is creating files of the larger size.

At the same time, others in the Working Group — notably the U.S. National Archives — are interested in essences that consist of uncompressed video streams. In this, they echo specifications in use at Stanford and Rutgers universities, as well as at the BBC.[8] File sizes for standard definition video run from 75 to 100 gigabytes per hour. Each member of the uncompressed trio has selected a different wrapper: QuickTime at Stanford, AVI at Rutgers, and MXF at the BBC. To some degree, the two universities' QuickTime and AVI approaches can be seen as provisional, i.e., as a practical thing to do now, while better ideas and technology mature.

Although the Working Group's current concern is focused on the reformatting of old videotapes, we also wish to develop an implementation of MXF that is extensible in at least three ways. First, there is a desire to embrace the output of film scanning activities. Second, one agency has expressed interest in using the MXF format to wrap "audio only" essences that result from the reformatting of sound recordings. And third is the matter of born digital video.

Regarding born digital video, the Working Group has frequently heard from organizations about their growing collections. Some of these are "non-memory" operating agencies, e.g., the National Oceanic and Atmospheric Administration (NOAA), where marine biologists and other scientists are producing extensive video footage. Another example is the Voice of America, where the staff wish to retain current broadcast productions for future repurposing. Meanwhile, files from agencies like these are destined for future handoff to the U.S. National Archives or the Library of Congress for permanent custody.

The *native encodings* for some born digital files are promising for sustainability for at least a few years, before format obsolescence reaches the point where transcoding is necessary. Examples include MPEG-2 and file-form DV. Other born digital files are in formats that may not be equally sustainable and these will require transcoding in the near term. We would like our MXF implementation to be capable of wrapping born digital encodings. For the sustainable native encodings, this action would support near- or medium-term preservation. It is worth noting that some agencies are required to retain even the less sustainable native encodings for many years; for example, copyright legal considerations may require that an item is kept "as submitted". All of these factors have made us seek an MXF wrapper implementation that can be extended to embrace born digital essences.

Beyond all of this, members of the Working Group have identified other content elements that would be well served by an extensible format, ranging from digital cinema to film-strips-with-soundtracks. Some members also see the archiving and preservation wrapper as a useful way to encapsulate items that are associated with the main content element. Examples of associated materials include such things as documents found in the original container along with the videotape, printed matter associated with a sound or moving image publication, transcriptions of oral history recordings, and detailed metadata of special "local" interest.

8 The Rutgers specification URL is: http://rucore.libraries.rutgers.edu/collab/ref/dos_avwg_video_obj_standard.pdf. Information about Stanford's reformatting is here: http://lib.stanford.edu/stanford-media-preservation-lab/moving-image-digitization. A white paper containing a 2007 description of the BBC approach is at this URL: www.bbc.co.uk/rd/pubs/whp/whp-pdf-files/WHP155.pdf.

About MXF, application specifications, and the Advanced Media Workflow Association (AMWA)

MXF is seeing increasing adoption in broadcasting and it is central to the digital cinema specification developed in Hollywood for theatrical distribution. These industries include the big customers for whom tools are built, and their broad-based adoption of MXF makes the standard attractive to us. It is also the case that SMPTE is the most important standards organization for professional broadcasters and movie-makers.

MXF is a broad-spectrum standard that features many options for packaging, metadata embedding, and essence encoding. The successful implementation of an MXF approach for any given application will be enhanced if users define a set of constraints. Well-defined constraints support the development of tools to validate files and encourage multiple vendors to provide conforming equipment. These actions will increase the degree to which practices are standardized and promote adoption. Those two outcomes will in turn increase interoperability, the feasibility of content exchange, and long-term, preservation-oriented data management.

For users of the MXF standard, formal constraint statements are called *application specifications*. These can be compared to JPEG 2000 profiles or to the profiles and levels that characterize MPEG video content, e.g., the MPEG-2 *Main Profile @ Main Level* (MP@ML). Like the profiles, each application specification is tailored to a particular *application*. The incubation of MXF Application Specifications is the special province of the Advanced Media Workflow Association[9] (AMWA), an organization that provides a meeting ground for professional moving-image users and vendors. The Working Group is working with AMWA in the development of the application specification.

One of the virtues of working with AMWA is the inclusion of both users and vendors in the discussion. The AMWA will form a special technical committee to finalize the specification and we anticipate that the committee's membership will include archivists from memory institutions, archivists from broadcast and motion picture production organizations, and representatives of the companies that manufacture the technology used by broadcasters and archives. We believe that this mix of participants will increase the likelihood that multiple vendors will build systems that meet the specification, which in turn will increase the likelihood that truly interoperable content will be archived for the future.

What might you find in an Application Specification?

At a high level, an application specification will cover the following:

- Aspects of the underlying MXF structure, e.g., which *operational patterns* are permitted, the use of *partitioning*, and the handling of *embedded metadata*, the use of *clip wrapping* and/or *frame wrapping*
- Picture — the permitted essence schemes (encodings) and other elements
- Sound — the permitted essence schemes and other elements
- The handling of timecodes
- Closed Captions and other VBI — about the elements in the Vertical Blanking Interval of the source signal and how they are to be retained in the digital copy
- Associated content elements — about the approach to be used to wrap in associated items like still images, documents, and texts
- Inclusion of file-integrity *hash data* ("checksums") to be used when monitoring digital content over time.

9 http://www.amwa.tv/

The 24-page application specification AS-03, published by the AMWA in 2010, provides a good sense of the structure and level of detail in this type of document.[10] AS-03 is "a vendor-neutral subset of the MXF file format to use for delivery of finished programming from program producers and program distributors to broadcast stations".

About JPEG 2000 and our proposed specification

JPEG 2000, like MXF, is a broad-spectrum standard with many options. It was developed by the International Standards Organization (ISO) and the International Electrotechnical Commission (IEC), and the family of standards documents carries the general identifier ISO/IEC 15444.[11] At last count, twelve parts have been published. The JPEG 2000 compression approach employs what is called the wavelet transform. When using JPEG 2000, one notable option is whether this transform is applied in an irreversible manner — resulting in lossy compression — or in a reversible manner — producing lossless compression. For our preservation-oriented application, the most desirable JPEG 2000 profiles are those that feature the reversible transform.

Various members of the moving image community have been developing digital cinema and broadcast profiles for JPEG 2000. The most recent publication is amendment 3 to part one of the ISO/IEC 15444 standard, titled *Profiles for Broadcast Applications* (ISO/IEC 15444-1:2004/Amd 3:2010). Two of the seven profiles in amendment 3 feature the reversible wavelet transform, i.e., lossless compression. We plan to reference this standard in our MXF application specification.

In the course of our exploration of the intersection of JPEG 2000 and MXF specifications, we have encountered one technical matter that is not fully resolved by the various existing documents: the handling and labeling of interlaced video. Experts in the field have said that there are a number of different ways to encode and label interlaced picture data in this context. At a high level, there is the question of whether the image stream consists of a series of *fields* or *frames*. At a finer level, there is the matter of how to indicate which field is dominant and how or when to employ what the MXF standard calls *frame-wrapping* as compared to *clip-wrapping*. If different approaches are adopted by different production systems, and if the labeling is inadequate, there is a risk that files will not interoperate, i.e., that a file produced on system A will not play back on system B.

How should interlaced image frames or fields be wrapped and labeled? What body should deliberate this question? One technical expert in the ISO/IEC JPEG 2000 standards community noted that this issue is not specifically about picture encoding: "It has to do with how you put the stream in a file," he said, "and that makes it an MXF problem", adding, "it will not be part of our work as we continue to develop broadcast profiles".[12]

Our Working Group agrees and we were pleased to learn of recent SMPTE plans to specify an approach (or approaches) for interlaced picture data in a to-be-drafted amendment to SMPTE ST 0422-2006, *Material Exchange Format - Mapping JPEG 2000 Codestreams into the MXF Generic Container*.[13] This standard was originally drafted to support the digital cinema specification. Since digital cinema consists of progressively scanned images, ST 0422 does not include recommendations for the handling of interlaced picture data. For the time being, we plan to include our own wording on interlacing in successive drafts of our MXF application specification even as we track the revision of SMPTE ST 0422.

10 http://www.amwa.tv/downloads/specifications/AMWA-AS-03-Delivery-Spec-1_0.pdf
11 Listings of all ISO standards may be found here: http://www.iso.org/iso/iso_catalogue.htm.
12 Personal communication.
13 http://store.smpte.org/product-p/st%200422-2006.htm

Ancillary data

It is worth noting that there is a similar wait-and-see situation regarding closed captioning and other ancillary data and, by extension, motion picture subtitles and other forms of adjunct content. On the video side, there are number of engineering nuances but roughly speaking this is about the data found in analog video signals in the vertical blanking interval (VBI) and about the similar data in the digital realm referred to as VANC. There is also horizontal ancillary data or HANC. Some of this pertains to North American standards; there are also multiple embedded-data specifications in play in other parts of the world, including the European Broadcast Union's Subtitling Data Exchange Format (EBU STL).

Why worry about retaining this embedded data? We believe that it includes information that is needed to properly understand and manage video content objects for the long term. In some cases, the embedded data may be construed to be an essential part of the original item that must be migrated forward in order to create an authentic and complete copy. In some cases, the embedded data contains information (closed captions or subtitles, other descriptive information) that — once ingested and indexed into a search system — will support researchers who seek to discover relevant materials. The embedded data is also likely to contain technical information that will support the management of the item and may also shed light on production-method or provenance topics of interest to researchers.

Our exploration has highlighted some options to consider, which I will describe in simplified form. The first option embraces *current practices* and trades on the use of what are called *ANC packets* in SMPTE standards.[14] The second option pertains to an *emerging practice* that should accommodate both US and European formats. This option would employ the structures being standardized in SMPTE-TT Timed Text standards (the ST 2052 family) being published during 2010 and 2011.[15] Meanwhile, there is a European Broadcast Union project to standardize the carriage of EBU STL inside MXF files. Finally, there is a current practice among broadcasters to create sidecar files (separate data files, not embedded in the main MXF file) that contain VBI and related data. This may be practical for the near term but we would prefer to see the adoption of a standardized, embedded-data approach.

Metadata

Our federal agencies discussions thus far have highlighted a dual approach to the embedding of metadata in MXF archiving and preservation files. On the one hand, we have talked about a minimal header (or header-like) element. In spirit, this would be akin to the Broadcast Extension (bext) chunk in the Broadcast WAVE file standardized by the European Broadcast Union. In practice, we would like to see something less constrained, with room for a bit more data, not the least of which would be multiple tagged identifiers. The data in the header-like element would be basic, consisting of metadata needed to identify and manage the content object as an object, e.g., in a preservation storage system.

On the other hand, to support more complete representations of descriptive, administrative, and technical metadata, we are discussing finding places "deeper in the file". Oliver Morgan, the Working Group's expert consultant, has called our attention to what are called *generic stream partitions*. These elements within MXF are standardized in SMPTE ST 410-2008, titled *Material Exchange Format - Generic Stream Partition*. These partitions were established for a variety of

14 Engineering wording for the first option may be found in the Section 5.1.7 of AS-03, op.cit. "If present, CEA 608 line 21 (CC and XDS) data shall be carried in a SMPTE ST 334-1:2007-and-ST 334-2:2007-compliant ANC packet within a SMPTE ST 436:2006-compliant VBI/ANC GC Element, using 8 bit encoding. If present, CEA 708B DTV captioning data shall be carried in a SMPTE 334-1:2007-and-ST 334-2:2007-compliant ANC packet within a SMPTE ST 436:2006-compliant VBI/ANC GC Element, using 8 bit encoding. Caption language shall be specified using AMWA AS-04."

15 The introductory standard is SMPTE 2052-0:2010: http://www.smpte.org/standards/st2052-0-2010.pdf

applications, one of which was to contain various classes of data streams, such as extensive blocks of "metadata that cannot suitably be stored in the Header Metadata (e.g., specialized preservation metadata)".[16] A corollary Recommended Practice document from SMPTE is RP 2057-2011, titled *Text-Based Metadata Carriage in MXF*, which "defines how to carry text-based metadata with a specified text MIME type encoded using either Unicode UTF-8 or UTF-16 character encoding (such as XML) in a MXF file".[17]

The Working Group is interested in technical metadata, the moving image equivalents to a pair of standards from the Audio Engineering Society: (1) AES57 (forthcoming; the draft form was labeled AES X098B), titled *AES standard for audio metadata - Audio object structures for preservation and restoration* and (2) AES-X098C (still only in draft), titled *Administrative metadata for audio objects - Process history schema*. The former provides a description of a given file's technical characteristics — not unlike the instantiation elements in PBCore[18] — while the latter offers a description of the process that created the file, what is sometimes called *digital provenance*. In the federal agencies effort, there is a subgroup devoted to technical metadata and their work is still under development.

The federal agencies Working Group does not anticipate offering significant recommendations regarding descriptive metadata. The group includes representatives from both archive and library organizations, with practices for resource description that vary in significant ways. With all types of materials, libraries favor *bibliographic data* while archives prefer *finding aids*. In the end, we are likely to have more to say about *where* a chunk of agency-produced descriptive metadata might be embedded than about *what* it should look like.

We also do not anticipate offering recommendations regarding structural metadata, beyond the structural option inherent in MXF itself. Different agencies and even units within agencies take a variety of approaches to content packaging — the *binding* or *bundling* of multiple related files. We have, however, discussed the idea of having the MXF application specification for archiving and preservation include a way to wrap collections, i.e., sets of items.

Conclusion

As we proceed, the Working Group is well aware that we are at an early stage in this process, with comparatively little experience. We believe that there is value in drafting a thorough application specification — an important step in the direction of standardization. But we will wait until we have more experience under our belts before making a firm recommendation to other archives.

This thought has led us to explore some form of provisional advisory: "What shall we do in the meantime?" We have heard from colleagues who, thinking of their videotapes in dire need of reformatting, are drawn to the practices at Stanford and Rutgers — mentioned earlier in this paper — that create files with uncompressed video streams in widely used wrappers like QuickTime and AVI. Meanwhile, for born digital content, other colleagues have sketched provisional plans to hold some newly arrived materials in their native video encodings, reckoning that these will remain playable for a few years. The Working Group is interested in provisional solutions like these and hopes to assemble an advisory in the foreseeable future.

16 http://store.smpte.org/product-p/st% 200410-2008.htm
17 http://store.smpte.org/product-p/rp%202057-2011.htm
18 http://pbcore.org/v2/elements/pbcoredescriptiondocument/pbcoreinstantiation

USING EXISTING INSTITUTIONAL RESOURCES FOR ESTABLISHING AND PRESERVING AUDIO-VISUAL COLLECTIONS

Toby Seay, Drexel University, Philadelphia

Introduction

In 2005, Drexel University in Philadelphia, PA received a donation of over six thousand reels of audiotape from the now-defunct Sigma Sound Studios vault. This collection contains music recordings by major popular music recording artists such as Patti LaBelle, Teddy Pendergrass, Grover Washington, Jr., Melba Moore, Gladys Knight, Gloria Gaynor, and many others. These recordings are the creation of musicians and producers associated with what is known as the "Sound of Philadelphia" (Cogan, Clark, 2003). Rooted in gospel and rhythm & blues, the musical output of Sigma Sound Studios developed into musical genres such as funk and disco and surpassed Motown in the 1970s "as the most visible and representative symbol of black capitalism" (Shapiro, 2005). When Sigma ceased operations, the collection owners sought to find a home for this historical resource when it became infeasible to continue properly storing it. Due to the nature of this collection, the donation was made to Drexel's Music Industry Program to provide a resource for studying popular music production and maintaining the legacy of the Philadelphia music community.

Archival preservation requires specialized skills in handling specific media. For instance, the audio objects of the Sigma Collection require professional audio playback machine operation skills and knowledge of magnetic tape handling. These specialized skills are different than those needed for handling rare books or manuscripts. Because these skills can be found among the faculty and staff of the Music Industry Program and because this program's students provide an internal user group, a commitment was made by Drexel University to accept the donation and to provide resources to house and maintain it. However, it became quickly evident that the Music Industry Program alone would not be able to handle all duties needed to preserve the Sigma Collection. Therefore, a collaborative approach was designed to handle the needs of the collection. This paper will discuss the importance of collaboration within an academic institution, the model created for collaboration and the issues involved with implementing this model. It is the desire of this paper to provide a model for creating effective partnerships with existing institutional units, which can increase the number of potential audiovisual repositories and to create greater educational opportunities within the field of audiovisual preservation.

Collaboration

In looking at literature regarding collaboration within archives, there is a wealth of articles available. However, most articles are focused on self-contained archives and how they can best serve their institution. For instance, collaboration is often used in the context of communication, such as an academic history department collaborating with the archives in developing resource materials for specific classes. While this type of collaboration is vital to institutional success, especially with regards to records management, this view differs from the model described in this paper where differing institutional units collaborate to serve the needs of a repository.

The strengths of collaboration in the context of this paper's model, however, are described in a number of articles of note. For instance, Joan Lippincott (2004, p.150) lists these goals of collaboration.

- Provide seamless services to users
- Leverage the various talents that different professional groups can bring to a service
- To pool institutional resources

Furthermore, the Society of American Archivists discusses collaboration in their publication 'New Skills for a Digital Era' and states: "…collaborative initiatives…take advantage of the skills of others [and] [n]o single skill set will fill all jobs" (2006, p31).

These articles point to the myriad duties needed to provide a fully functioning repository and suggest that it is impossible to fill those roles with a single person or single institutional unit. For instance, the following is a list of archival duties performed within a repository. Though this list is by no means comprehensive, it serves to show the breadth of the skills needed within an archival institution.

Collection Development
- Appraisal
- Assessment

Collection Management
- Arrangement
- Description
- Database Management

Public Services
- Reference Services
- Outreach
- Public Relations

Preservation
- Object Handling
- Equipment Operations
- Format Specific Procedures
- File Management

Systems
- Equipment Maintenance
- Storage System
- IT Support

Management
- Institutional
- Project
- Policy Statements

In looking at these duties, it is apparent that a fully functioning repository is a team effort. For instance, in an audiovisual archive, it is unlikely that a specialist in audio engineering will also possess the skills needed for database management or reference services. In addition, a metadata specialist may not possess the skills necessary for proper audiovisual equipment operations or maintenance. Therefore, it is necessary to fill these skill gaps with specialists. Within an institution, however, these specialists may already exist in separated units and can often be found outside of the archives or records management units.

Institutional Units model

Drexel University's commitment to preserving the Sigma Sound Studios Collection was based on its benefit to a built-in user group: Music Industry students. Music Industry students would be able to use this resource for the study of music production, copyright issues and audio object preservation. With this user group in place, the University was able to justify the costs associated with accepting and maintaining an audiovisual collection. However, since this donation was made to the Music Industry Program, not an archives or library sciences program, there was very little planning with regards to a preservation methods, use restriction policies or arrangement. All of the archival duties previously discussed were not considered beyond what the faculty and staff of the Music Industry Program could perform due to their expertise in audio technology. This initial plan can be seen in Figure 1, which displays a monolithic ap-

proach to archival operations. Here, all archival operations are handled by and for the Music Industry Program.

Figure 1 Drexel University Audio Archives inadequate monolithic plan

This initial approach proved inadequate, and was made apparent when seeking external project funding. Within funding proposals, it was impossible to show how archival duties could be well implemented by a single unit. While the collection would remain under the purview of the Music Industry Program, it was necessary to revise and implement a new plan that would adequately cover all archival functions to the benefit of the collection and its users. Research and outreach to the Library & Information Sciences Program helped design and shape a new approach to preserving the Sigma Collection. This new preservation plan not only fills the gaps in archival duties, but it opens the door to new user groups by expanding the scope of operations. For instance, with the inclusion of the Library & Information Sciences Program, students from that program can develop audiovisual preservation techniques in conjunction with their archival studies.

The approach taken was to implement a cross-disciplinary approach that fitted within the University's strategic initiatives. The result was a plan that includes three academic colleges and two administrative offices. Figure 2 graphically displays these internal collaborators and their areas of expertise. The Music Industry Program uses its expertise in audio technology to maintain and operate audio playback equipment, create digital preservation files and capture preservation and technical metadata. The Library & Information Sciences Program uses its expertise in information management to arrange the collection, create databases and finding aids and capture descriptive metadata. The College of Engineering is able to provide system design and IT support through the Computer Science Program while customized software for equipment process modeling is performed through the Electrical & Computer Engineering Program. The University's Office of General Counsel oversees collection policies, such as user access and donation contracts, and copyright compliance. And, finally, the University Research Office provides grant-writing support in seeking external funding.

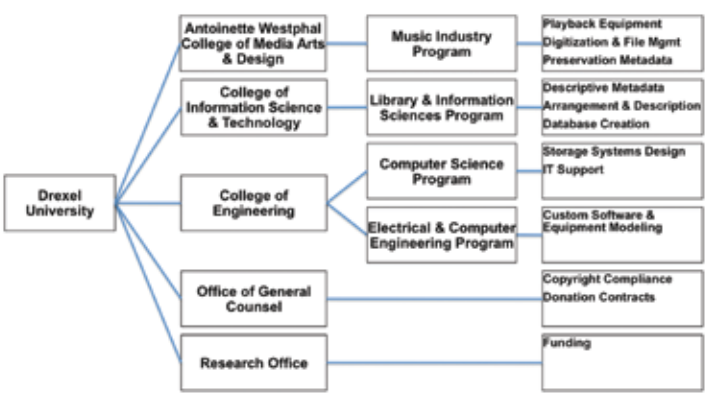

Figure 2 Drexel University Audio Archives internal collaborators

Not all aspects of audio preservation can be covered within the institution, however. When equipment and software vendors are needed, as well as workflow consultation, external collaborators are necessary. With most institutions, it is important to use limited funding in the most effective manner possible. It was determined at Drexel that project consulting and the

acquisition of obsolete playback equipment were areas where the costs represented great value. Looking externally for these one-time expense events is a way to maximize efficiency. For instance, having an external vendor research, locate and refurbish obsolete playback equipment saves valuable time to the institution while also providing warranty service to expensive equipment. Figure 3 shows the external collaborators and how they were used for the Drexel Audio Archives. These external collaborators helped shape and design the needed systems for a proper preservation environment and fill the gap in planning expertise with regards to workflow, preservation methods, and metadata design. The Board of Advisors is the only continuous external collaborator. These experts from industry oversee preservation standards and methodology while providing project support.

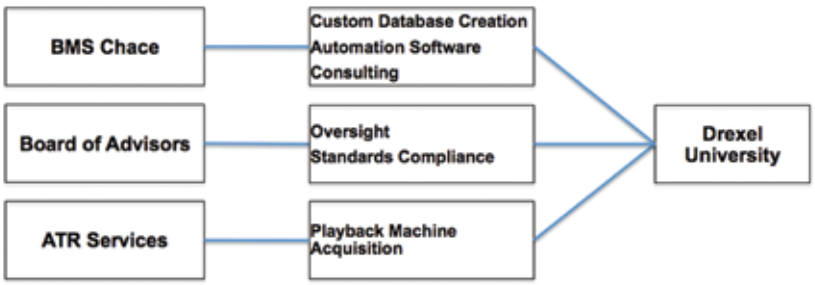

Figure 3 Drexel University Audio Archives external collaborators

There are some institutional units that are conspicuously missing in these collaboration models. For instance, the university library and the university archives are noticeably not included. Their exclusion is not due to any unwillingness for collaboration. Rather, their exclusion is due to different priorities and focus. For instance, the library and archives serve the informational needs of the entire university. Their priority must be to serve the traditional role of an academic resource provider. While these units are not currently internal collaborators, they are supportive of the Drexel Audio Archives and reside on the list of potential internal collaborators. Along with these potential internal collaborators is the potential for external collaborators. For instance, the Drexel Audio Archives could provide services to an external for-profit institution on a specific project with unique educational and historical opportunities. While there is no specific plan in place to do so, the potential benefits are not overlooked.

User groups

While the initial plan for the Sigma Collection was to provide primary resources for Music Industry students, the implementation of the Institutional Units Model expands the reach of the repository to a greater number of users. For instance, while Music Industry students can use these resources to study record production techniques, copyright and legal issues, and audio object preservation, Library & Information Sciences students can use these resources to study metadata and database design as it relates to audiovisual collections. Electrical & Computer Engineering students can study systems design and audio equipment design as it relates to an audiovisual repository. Maintaining an audiovisual collection not only provides a resource for research into its content, but also into its preservation and structure. Defining these internal users is an important step in determining if the creation of a repository is worthy of institutional commitment. Without a stable source of internal users, a case would have to be made for the demand from external users, making funding commitments more difficult for the institution.

However, a fully functioning repository is made possible by implementing the Institutional Units Model, which allows the initial intent to serve an internal user group to be expanded to serve an external one. For instance, musicologists need primary resources for popular musicological research and for research into music production trends. Having a popular music repository

serves this need while preserving the cultural heritage of the music community. The original collection creators', record labels' and publishers' interests can all be served by providing a cost effective means of preservation. When justification for funding is always a struggle, expanding the number of research users is of great benefit to the repository as it will "reinforce the value of the archival program and may provide the basis for appealing for additional resources" (Dearstyne, 1997, p.194).

Implementation

There are many benefits to implementing the Institutional Units Model in forming an audiovisual repository as well as some barriers to efficient implementation. While these barriers are not insurmountable, they do have costs. For instance, each institutional unit, while being committed to the project, has separate agendas and priorities. While these separate agendas rarely pose a direct conflict with the project, they do present barriers in efficiency. Where one unit is ready to pass a project on to the next unit, there may be gaps in readiness, which can slow the overall pace of the project. Project leadership can also pose a barrier to progress. For instance, unless there is a defined project leader, each unit may struggle with project "ownership". The responsibility for seeking project funding and determining who benefits from that funding must be clear. While these struggles can be managed, any ambiguity in leadership can have a great effect on the project.

Since this model is based on an academic institution, much of the project workforce comes in the form of students. While this provides a large cohort from which to choose workers, there are difficulties in managing a schedule. Due to academic scheduling, every faculty member, staff member and student has a different schedule each term. This schedule change can lead to quick turnover in the repository workforce. Managing this schedule and keeping projects on task is a high priority in repository leadership. Funding a full-time archivist to manage the repository may be money well spent.

However, having multiple units involved in a project provides valuable insight and perspective to those working in the repository. It is under these collaborative conditions that the cross training of skills can be accomplished. The educational opportunities that can widen a student's horizons and skill sets are numerous when working in proximity to others outside their respective field. Training audio engineers in database management and training catalogers in media identification are a few examples of broadening knowledge within the audiovisual preservation field. The Institutional Units Model also provides the opportunity to turn tacit knowledge into explicit knowledge. Tacit knowledge is difficult to convey. In his paper on organizational knowledge, Dick Stenmark states: "Tacit knowledge not being available in an explicit form makes it difficult if not impossible to quickly spread or share it within the organization" (2000, p.11).

However, by intertwining participants from multiple units, the ability to convey tacit knowledge is made easier. For instance, each unit provides specialized skills to the repository. While implementing these skills in a working repository, each participant will be able to express their knowledge to students and other project participants. A sound engineer, for example, could demonstrate playback machine quirks that, while not expressed in the operations manual, are known through experience. This practical aspect to the field of audiovisual preservation serves to reinforce the theoretical aspects that are more explicit in nature.

Conclusion

It is important to find effective partnerships that work best for the institution, the collection and resource users. Done well, constraints in funding are eased by the use of shared resources and individual expertise can be focused where it best suites. Since there are many educational institutions that feature similar programs as Drexel University, there is a potential for establishing more repositories for similar collections if donors and institutions can connect. And finally, with internal collaboration, students from each discipline can glean perspective from each other and improve the awareness of preservation issues. For instance, music students will gain

knowledge about information sciences and library and archives students can gain knowledge about audiovisual materials. By leveraging the skills from individual institutional units within academic institutions and the high educational value that this collaboration presents, both the institution and the collection benefit, providing researchers with greater resources.

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AN OVERVIEW OF EARLY COMMERCIAL WILDLIFE RECORDINGS AT THE BRITISH LIBRARY

Cheryl Tipp, Curator, Wildlife Sounds, British Library

The British Library holds one of the most important and impressive audio collections in the world. The scope of this archive is vast, with recordings representing several musical genres, oral history, drama and literature, radio and wildlife.

The wildlife collection is internationally renowned as one of the best public resources for species and habitat recordings available today. It is best known for its wealth of unpublished recordings that cover all animal groups, from birds and mammals to amphibians and invertebrates. The breadth and depth of this section of the archive has allowed the Library to successfully support academic research, educational programmes and artistic expression for over four decades.

There is another section of the archive, however, that is perhaps less familiar yet provides a fascinating insight into the history of wildlife sound recording, from its infancy in the early 20th century to the present day. Initial efforts were restricted to recording captive animals but through technological developments, inventiveness and a good measure of determination, equipment could soon be taken out into the great outdoors and wildlife sound recording in the field began. The efforts of the early pioneers who tackled the various challenges of location recording in order to produce publications for the commercial market, paved the way for fields such as bioacoustics, which are now respected areas of the scientific community.

This paper seeks to provide an overview of the British Library's collection of published wildlife recordings from the gramophone era. Much change was seen during this period and the following examples demonstrate how the genre of wildlife sound recording evolved during its first fifty years.

The birth of wildlife sound recording

Ludwig Koch is described as the father of wildlife sound recording and is arguably the greatest pioneer in this field. He made the first ever recording of a bird in 1889, at the tender age of eight, when his father brought home an Edison Phonograph and a box of cylinders. The subject of Koch's experiment was his pet Indian Shama, a species whose rich, melodious song made it a popular cage bird. Koch would go on to play a significant role in the development of wildlife sound recording, but the credit for producing the first ever commercial wildlife recording would go to fellow German, Carl Reich.

In 1910 the German branch of the Gramophone Company released 'Actual Bird Record made by a Captive Nightingale'. The list of new records published by the Gramophone Co. Ltd in August 1910 described the recorded Nightingale as being a famed songster that was "taken about through Germany by its proud possessor for show purposes". The bird in question belonged to canary breeder and bird collector, Carl Reich, who kept an aviary in Bremen, Germany and was to have a recording career that spanned almost thirty years. Eight separate recordings of the Nightingale were collected by audio engineer Max Hampe, who had travelled to Reich's base in May 1910 to conduct this acoustic experiment. Each recording was originally released in Germany in single-sided form and copies were soon available in many European countries, including the United Kingdom, as well as the USA, Russia and even Australia (Figure 1).

The Gramophone Co. Ltd actually explained the recording process in their list of 1910, which reinforces the significance of this recording achievement. According to the promotional passage, "The cage was suspended in front of the horn, and as soon as the recording motor was set in motion, the bird began singing and did not stop when it should, as will be seen by the last note of the record, which clearly shows the bird went on singing after the instrument stopped recording."

Figure 1. One of Reich's early captive Nightingale releases (The Gramophone Co. Ltd, 1913)

Reich was to dominate the commercial arm of wildlife sound recording for the next decade, with further recordings of singing Nightingales being released in 1912. The scope of this publishing programme was then widened and other birds in Reich's collection were recorded. Successful takes were published by the Gramophone Company and Zonophone, with titles such as 'Actual Bird Record made by a Captive Thrush' (1913) and 'Duet: Mock Nightingale, Garden Warbler' (1926) being released in several countries.

The birds of Reich's recordings were all chosen based on their reputation as versatile and talented songsters. Species such as the Nightingale, Blackbird and Domestic Canary are renowned for their sustained singing bouts and the variation, tonal quality and frequency of these songs would clearly make these popular recording subjects for both the engineers charged with recording the songs and the public listener.

For the first time ever, people could listen to a recording of an actual bird, albeit a captive one, from the comfort of their own home. This moment signified the birth of a completely new variety of sound recording for the commercial market and presented a fresh way of appreciating wildlife. No longer did the natural history hobbyist have to make do with a collection of monographs, illustrations or inanimate specimens. Sound recordings of wildlife had now come onto the scene and there was to be no looking back.

Recording in the wild

Cherry Kearton was responsible for the first recordings of wild birds when he captured the song of a Nightingale and a few phrases from a Song Thrush in England in 1900.

The first commercial recordings of a wild animal came about, not through the tireless work of a naturalist, but through the suggestion of a musician. Beatrice Harrison was a respected British cellist who had made broadcasting history in 1924 when the sounds of her playing alongside a wild Nightingale in Oxted, Surrey were transmitted live by the BBC. Harrison believed the Nightingales were stimulated by the sound of her cello and the popularity of this first broadcast led to several similar programmes being made over the next few years. The Gramophone Company agreed to publish a selection of pieces featuring Beatrice Harrison with "her" Nightingales and in May 1927 the label's mobile van recorded what would become five double-sided discs that were widely circulated around the world. We will never know whether the birds were encouraged to sing by Harrison's cello or were simply delivering their musical messages at times of the day when they would be most vocally active anyway. What we do know is that these recordings represent another key landmark in the history of wildlife sound recording.

Novelty acts and canary choirs

The tradition of keeping canaries as cage birds is a long one. Their strong, varied songs and penchant for imitation made them extremely desirable as pets. The German canary trade was one of the most respected in Europe and birds reared in Germany were highly sort after. Richard Avis said in his book of 1872, *The Canary: its history, varieties, management, and breeding*, "The Germans, who care little for either the form or colour of their birds, pay great attention to their song and we advise all those who wish to fully develop the good qualities of young canaries to place them under the tuition of a German bird" (p35).

Carl Reich kept canaries in his Bremen aviary and several of these birds were recorded for publication. In some cases, the canary recordings were combined with folk songs and these records from the late 1920s represent some of the earliest examples of fusion between music and wildlife recordings for the commercial market.

Musical Dawson's Famous Choir of Canaries became the star ingredient of eleven records released in the UK from 1932 – 1933. Dawson's singing canaries were recorded and then mixed with a pre-recorded small orchestra to create unique versions of 'The Blue Danube', 'O Sole Mio' and 'Tales of Hoffman' among others. A wonderful British Pathé newsreel film from 1938 showed Musical Dawson accompanied by a choir of nine caged canaries while he played 'In a Monastary Garden'.

In the USA, Lorraine Evon & The Golden Bird became a popular Vaudeville act in the 1920s. A photograph of the young Miss Evon posing with the canary perched on the end of her violin can be found in the photographic collection of the drama critic and theatre promoter James Willis Sayre, who collected images of stars performing in Seattle from around 1900 to 1955. Brunswick released a double-sided record of the duo in 1930, which featured 'The Canary Polka' and 'The Birds and the Brook' (Figure 2).

Figure 2. Disc label for 'The Birds and the Brook' (Brunswick, 1930)

An equivalent music hall act in Britain was The Auklands and Little Tweet. Little Tweet was dubbed the 'Canary Caruso' in light of his vocal virtuosity and skill, and the Auklands toured the music hall circuit from 1924 onwards. The singing canary would accompany Betty Aukland on the concertina and proved to be such an entertaining act that a record of Little Tweet performing 'Bells of St Mary's' and Londonderry Air' with the Auklands was released by Edison Bell in 1929. This feathered performer became quite the celebrity and was used in marketing campaigns to endorse products such as Capern's bird food.

Mimicry

The focus of the first wildlife publications was, unsurprisingly, birdsong. Each disc would normally contain one uninterrupted recording of a singing bird (or one on each side for double-sided discs), which had been selected based on the aesthetic nature of its song. No additional information was offered explaining the role of birdsong in the life of a species, and only the most pleasing vocalisations were deemed worthy of publication.

Within a few years the evolution of this genre had begun to slowly gain momentum and it was not long before publishers and recordists recognised the potential for expansion and began to look beyond the simple beauty of birdsong. Sound recording could be used to demonstrate various elements of acoustic communication and in doing so, could add a scientific element to the listening experience.

Reich had touched briefly on the subject of mimicry in birdsong when 'Canary – taught to sing like a Nightingale' was published in 1913. The first dedicated study of mimicry appeared almost two decades later when 'The Song of the Lyrebird' was released in Australia. 'The Song of the Lyrebird' (1932), recorded under the supervision of amateur film maker Ray Littlejohns, included a spoken commentary which guided the listener through the various imitations performed by a Superb Lyrebird. This species has long been considered one of the finest songsters to be found in Australia and its ability to mimic other sounds is second to none. This record was also significant because the songs featured on this disc were the first ever recordings to be made

in the Australian bush of a wild bird in its natural habitat. This talented individual mimicked species such as the Kookaburra, Australian Thrush and Eastern Whipbird to perfection and as both the natural and imitated songs produced by the Superb Lyrebird are pleasant to listen to, this clearly made the song an ideal recording subject. The repertoire of other notable mimics such as the Northern Mockingbird of North America would be used to create similar records that celebrated mimicry in birdsong over the coming years.

The ability of particular cage birds to accurately mimic the human voice led to several gramophone records being published in the early – mid 20th century. Hearing a Budgerigar recite nursery rhymes or give his home address created a novel listening experience and seemed to capture the curiosity of the general public. The vast majority of publications focused on one individual, for example 'Billy Peach, the Talking Budgerigar' (1940) and 'Joey the Budgie' (1952), but "I'll Give you Talk Like This" (1938) included several short excerpts of talking birds.

The most famous talking Budgerigar of them all was Sparkie Williams. This incredible Guinness World Record holder was said to have a vocabulary of more than five hundred words and won the BBC International Cage Word Contest in 1958. His winning performance led to a record being produced of edited dialogue between himself and a human interviewer (Philip Marsden) which is quite something even today. His owner was Newcastle-born Mattie Williams who applied an almost military approach to Sparkie's vocal training. When listening to 'Sparkie Williams, the 1958 Champion Talking Budgerigar', traces of his Geordie accent are clearly audible.

Vocabulary and the meaning of sounds

In 1934 Ludwig Koch and Lutz Heck (Director of the Berlin Zoological Gardens) worked together on the first commercial publication to focus on the vocabulary of a specific mammal. One side of 'Der Wald Erschallt' (published by Verlag Knorr & Hirth in 1934) was completely devoted to the various call types of the Red Deer. Koch and Heck were possibly taking a risk by focusing on this species because, unlike birds, mammals are not renowned for the musicality or attractiveness of their vocalisations. The popular appeal and obvious market for birdsong may have contributed to the decision to feature a montage of thirteen birds, including the much beloved Golden Oriole, Nightingale and Song Thrush, on the opposite side of this disc.

Documenting a species' vocabulary incorporated an important scientific element into the publication as it illustrated that animals could utilise many different vocalisations to express specific functions and meanings. Possibly the best example of this was 'Animal Language', a sound book by Ludwig Koch and the evolutionary biologist Sir Julian Huxley in 1938. The publication was constructed in such a way that the disc complimented the book and vice versa, and neither could be fully appreciated without the other. This unison of text, image and sound created the first detailed consideration of animal behaviour available to the general public, with particular emphasis placed on the importance of acoustic communication within the animal kingdom. It also allowed the authors to explain the process of wildlife sound recording with all of its challenges and requirements. Ludwig Koch travelled around Whipsnade and London Zoos for several months in late 1937 – early 1938 using a portable recording studio in the form of a seven ton van. A microphone connected to a long lead would be attached to the required enclosure, meaning that the van could be positioned out of view so as not to disturb the animal in question. The book contains a wonderful passage that will resonate with all wildlife recordists and tells the tale of Koch's attempts to record wolves at Whipsnade. Huxley wrote:

> The wolf pack at Whipsnade can only be described as disobliging. As the head keeper explained, the wolves usually start their concerted howling when they hear a particular siren which goes at five each afternoon. But when the microphone was put in position, the siren failed to elicit any response. The wolves looked towards Mr Koch, who was standing by it, with a sort of sly defiance, but remained entirely mute.

One can sympathise.

Identification guides

The sole function of the earliest published wildlife recordings was to entertain and amaze the listener and this general purpose was sustained until the early 1930s when the first identification guides came onto the market. The role of the identification guide was to aid both the amateur and professional ornithologist in learning to recognise the songs and calls of commonly heard species. The first collection of wild bird recordings to be brought together on one disc was 'Bird Songs Recorded from Nature' by Albert. R. Brand and M. Peter Keane, released in the USA in 1931. Brand came to the Cornell Lab of Ornithology in 1929 after leaving his job as a broker on the New York Stock Exchange. Studying ornithology under the lab's founder, Dr Arthur Allen, allowed Brand to pursue his interest in sound recording and together with undergraduate Peter Keane, they began to build up a collection of American bird voices. Cornell would go on to produce notable North American field guides such as the six disc set 'American Bird Songs' which was released in 1942.

Another pioneer field recordist was the self-taught Danish ornithologist Carl Weismann. During his lifetime, Weismann recorded a wealth of material and published a number of recordings, many through his own record label. In the early 1930s, Weismann approached the recently founded Dansk Stats Radiofonien (Danish State Radio) and enquired as to whether they possessed equipment that would be suitable for recording wildlife in the field. As wildlife sound recording was still largely unexplored at the time, Weismann must have put forward a convincing argument because the following spring saw him setting up dynamic microphones in the Danish countryside. Microphone signals were transmitted to a radio studio via telegraph wires which ran alongside a railway line and cut into wax discs which would later be used to create permanent records of Weismann's efforts. The Thrush Nightingale was the first species to be immortalised using this method and many more birds were to follow over the coming years.

Five discs were published as an untitled set at the end of 1934 and distributed to schools across Denmark. Weismann would go on to compile an impressive collection of wildlife recordings, many of which were published on the Carl Weismann record label. 'Voice Recordings of Danish Birds' was a collection of eleven discs released from 1939-1955, which featured 66 species and introduced the concept of geographical variation within the songs of birds such as the Yellowhammer and Chaffinch.

Weismann produced other identification guides that covered a range of birds, mammals and amphibians as well as discs specifically aimed at children. Weismann's singing dog orchestra is perhaps his best known achievement outside of the ornithological community, with 'The Singing Dogs' making it to number 22 on the Billboard chart in 1955.

Ludwig Koch had begun his wildlife recording career in Germany, working with Berlin Zoological Gardens Director, Lutz Heck, on 'Schrei der Steppe' (1933) and 'Der Wald Erschallt' (1934). In 1935 Koch worked with ornithologist Dr Oskar Heinroth on 'Gefiederte Meistersänger', which comprised three double-sided discs featuring the songs and, in several cases, the calls of twenty five German birds. The discs were accompanied by a ninety-six page illustrated book which provided in depth information on each species. A second three disc volume was released by Heinroth in 1937, at which point Koch had fled Nazi Germany and taken up residence in the UK.

Shortly after his arrival, Koch was introduced to the well known publisher Harry Witherby, and alongside ornithologist Max Nicholson, the trio began work on a sound guide to the voices of common British birds. 'Songs of Wild Birds' was released in 1936 (Figure 3) and was the first of several notable identification guides to be championed by Koch. 'More Songs of Wild Birds' was released in 1937 and the four disc set 'Songs of British Birds' appeared in 1953. This guide, produced in collaboration with the BBC, was the first to group species according to habitat.

Figure 3. Box set cover illustration for 'Songs of Wild Birds' (Witherby, 1936)

The Swedish Broadcasting Corporation (Radiojanst, then Sveriges Radio), began a programme of natural history location recording at the beginning of 1925. The aim was to compile a collection of Swedish bird recordings for broadcasts and publication that would encourage a greater appreciation and interest in the natural world. The first publications to be compiled were a series of five double-sided discs that featured twenty three common bird species including the Skylark, Blackbird and Cuckoo. The discs were prepared specifically for Swedish schools and were available by December 1937. A Marconi steel tape recorder was used to make these initial recordings as it allowed up to thirty minutes of uninterrupted recording. Useful segments from that thirty minute window of sound could then be copied on to disc.

In 1938, Radiojanst obtained its first mobile recording van and this signalled the beginning of an immense recording programme undertaken by Gunnar Lekander and Sture Palmér which resulted in no less than sixty five discs containing the voices of one hundred eighty three species being released from 1938 to 1956.

Tsuruhiko Kabaya and Kasuke Hoshino were responsible for the first published collection of bird sounds from the Palearctic region to be recorded outside Europe. 'Japanese Bird Songs' was published in 1954 by the Japanese Victor Company and comprised nine discs of vocalisations and general bird choruses.

Witherby's Sound-Guide to British Birds was the greatest achievement in avian identification guides when it was published in 1969. The compilation consisted of thirteen double-sided discs featuring one hundred ninety four species (over three hundred individual recordings) and became the first comprehensive guide to British bird vocalisations. Myles North and Eric Simms (the then Director of wildlife sound recording projects at the BBC)

co-authored the set and together produced one of the finest natural history publications ever released. Broadcaster and naturalist James Fisher described the collection as being "a milestone on the golden road of ornithology" and represented "the most important instrument for the advance of our art, sport and science that has been made since the Handbook of British Birds appeared in 1938-41" (pv).

The demise of the 78

After a life span of around fifty years, the 78 rpm disc was gradually replaced by newer formats that offered features such as improved signal to noise ratio, wider frequency and dynamic range, longer playing times and increased substrate flexibility. By 1960 the gramophone record was largely out of production and the era of the 78 had come to an end.

Conclusion

A complete description of all commercial wildlife recordings released during the gramophone era is beyond the scope of this article. The intention has been to highlight some of the key events in the history of early wildlife sound publications and celebrate those early pioneers who played critical roles in the development of this genre. Many of these publications formed the foundations of natural history sound archives such as those located at the British Library and the BBC. In the early days of archiving wildlife sounds, the proportion of published recordings to unpublished was much higher than it is today. The emergence of portable recording equipment at affordable prices allowed individuals to start building their own personal collections and this resulted in the proliferation of unpublished recordings. Recordings produced for non-commercial purposes now greatly outweigh published items in the British Library's wildlife sound collection. Commercial recordings still make a valuable contribution to the archive as they help document technological developments, express the change in popular tastes and demonstrate the continued evolution of an audio field.

Almost all publications discussed in this paper are archived and available for listening at the British Library. A selection of early wildlife recordings can also be found on the British Library's website http://sounds.bl.uk/.

The Library continues to seek out items that are not represented in the archive and strives to possess a complete collection of commercial wildlife recordings from 1910 to the present day.

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EMBEDDED METADATA IN WAVE FILES: A LOOK INSIDE ISSUES AND TOOLS

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What is Embedded Metadata

Metadata is an integral component of digital preservation and an essential part of the digital object. Files without appropriate metadata are not understandable, interpretable, or manageable. Effectively, there is no preservation or meaningful access without metadata.

In the file-based domain metadata can be stored using one of two primary methods. First, it can be stored external to the digital object, such as in a database or XML file. This external record must necessarily be associated to the source object via file pathways, unique identifiers, or other means. Second, metadata can be embedded with the object itself. "Embedded metadata" can be most simply defined as metadata that is stored inside the same file, or container, that also stores the essence to which the metadata refers.

In many ways one can think of embedded metadata as the file-based domain's equivalent of labels, annotations, and written documentation stored inside of material housing, or even as "in-program" annotations such as audio and video slates at the head of a recording. In essence, these are all means of maintaining external or non-inferable intellectual knowledge pertaining to content and carrier, leveraging the technology supported by the carrier.

This article discusses the significance of embedded metadata and some of the challenges that arise once this understanding is realized. While the discussion ranges across media types and file formats, the focus is more specifically on metadata embedded in audio WAVE files.

Why embed

In 2009, the Federal Agencies Digitization Guidelines Initiative's Audio Visual Working Group (FADGI) published a document titled, *Embedding Metadata in Digital Audio Files*[20] that explored the topic of embedded metadata within the context of archives. The following is an excerpt from this document:

> **"Why embed metadata?**
> Embedded metadata can provide information to and support functionality for various persons and systems at a variety of points in the content life cycle. For example, it can help the digitizing unit or organization as it produces and preserves content. It can serve persons or systems who receive content that is disseminated by the digitizing unit or organization. Some metadata elements are especially valuable to internal actors, some to external, and some to both.
>
> Embedded metadata, of course, is rarely an agency's only metadata. In most archiving and preservation programs, workflow and archiving are supported by one or more databases, cataloging systems, finding aids, and the like, each of which contains metadata."

For those already embedding metadata in files, the primary intent is generally to convey only the critical information necessary for intellectual and access control in situations where the

19 AudioVisual Preservation Solutions 350 7th Ave., Suite 1603, New York, NY, 10001, USA. ph: 917-548-8632, fax: 866-264-4275, chris@avpreserve.com, http://www.avpreserve.com, facebook.com/AVPreserve, twitter.com/AVPreserve

20 Federal Agencies Audio-Visual Working Group. 2009. *Embedding Metadata in Digital Audio Files: Introductory Discussion for the Federal Agencies Guideline*. http://www.digitizationguidelines.gov/audio-visual/documents/Embed_Intro_090915.pdf Consulted 20 May 2011.

file has been disassociated from its database, maintaining a minimal approach to the number of fields selected for embedding.

Is "why" even the right question?

To be clear, the FADGI report referenced above explicitly states "The associated guideline pertains to embedded metadata in audio files that result from the reformatting of analog content." The question addressed within this stated constraint is, "Why embed metadata?" In other words, why establish workflows outside of the reformatting process to actively capture and insert metadata for embedding with a file?

The reality is that despite any choices about whether or not to embed metadata in files resulting from digitization activities, embedded metadata is already pervasive in born digital media.

Producers of content rely on embedded metadata for management of media and workflows in the production process. This need has resulted in production and asset management developers integrating embedded metadata mechanisms into their systems. End-users rely on embedded metadata for search and retrieval of audiovisual content on a daily basis within computer operating systems, applications such as iTunes, and on sites such as archive.org where users share audio files.

These requirements for producers and end-users often converge in the distribution and use of file-based materials. As a wide spread example, it would be almost unthinkable for a band to place audio files online without embedding metadata in them to at least identify the artist, song title, rights, etc. Without this information, users could not find and access songs, and distributors like iTunes would have no means of determining what song was sold and, therefore, no means of assigning and disbursing royalties.

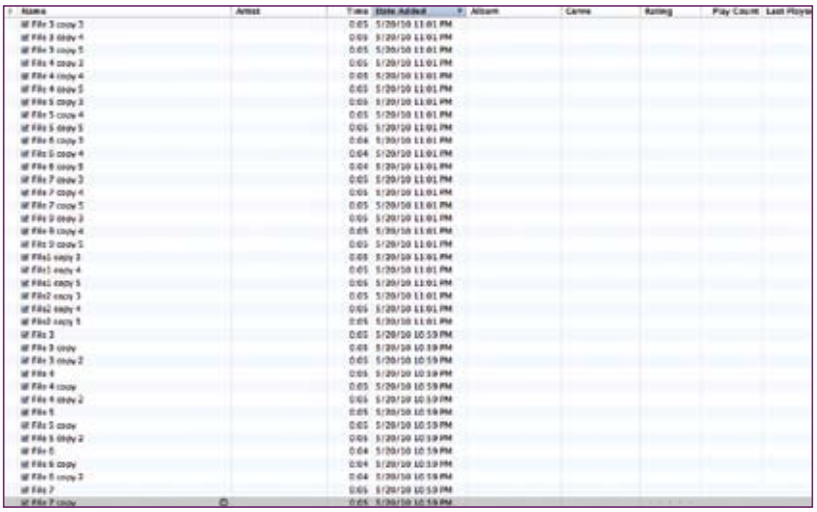

Figure 1: An example of what an iTunes library would look like if files imported had no embedded metadata

Looking outside of the audiovisual realm, the legal system has also taken note of the significance of embedded metadata. In a 2009 Arizona Supreme Court Decision,[21] the Court ruled in favor of a police officer that sued for employment discrimination. A letter drafted by his

21 Arizona Supreme Court. David Lake v. City of Phoenix. Arizona Supreme Court No. CV-09-0036-PR. http://www.supreme.state.az.us/opin/pdf2009/cv090036pr.pdf Consulted 20 May 2011.

superiors regarding his performance was submitted as evidence in court. Through inspection of embedded metadata it was discovered that the letter had been backdated and was a falsification. As part of the Court's decision it stated "if a public entity maintains a public record in an electronic format, then the electronic version, including any embedded metadata, is subject to disclosure under our public records laws."

Figure 2: A look at some embedded metadata within a word document

Since the late-1990s, photographers and imaging professionals have worked together to establish and widely adopt the International Press Telecommunications Council (IPTC) Photo Metadata Standard, a robust standard enabling rich sets of embedded metadata to be leveraged within workflows and applications that handle digital images.

Figure 3 shows a picture published on the White House's Flickr account.[22] Figure 4 shows some of the metadata embedded in the photo extracted using Phil Harvey's ExifTool.[23] Figure 5 demonstrates that, using the Mac OS search utility, this photo can be found on a hard drive by searching for the photographer's name. Embedded metadata enables discovery where file names and text (or lack of text, as in image files) are inadequate for search requirements.

Figure 3: Picture downloaded from the White House's Flickr Account

22 White House Photo Stream. Flickr: http://www.flickr.com/photos/whitehouse/5245486755/sizes/l/in/set-72157625560847260/ Consulted 20 May 2011.

23 ExifTool Website: http://www.sno.phy.queensu.ca/~phil/exiftool/ Consulted 20 May 2011

Figure 4: Portion of information embedded in photo displayed in Figure 3 using Phil Harvey's ExifTool

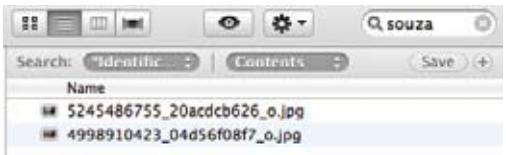

Figure 5: Results of files containing "souza", including the photo shown in Figure 3 and another photo from the White House's Flicker account

Recently, an open source application by the name of *creepy* was developed by Yiannis Kakavas, an academic interested in information security who wants to raise awareness about the information that people are making available about themselves via publishing files to the Internet. Creepy is described[24] by the creator as "an application that allows you to gather geolocation related information about users from social networking platforms and image hosting services. The information is presented in a map inside the application where all the retrieved data is shown accompanied with relevant information (i.e. what was posted from that specific location) to provide context to the presentation." The application harnesses the GPS data embedded into photos and recordings created on personal devices and by services such as Twitter and Foursquare. When made so readily accessible and viewed in the aggregate many people find the level of information disclosed by use of creepy to be disturbing (and thus an aptly named application). This project also recalls the April 2011 discovery that Apple iPhones have been tracking and storing up to a year's worth of GPS location data.[25]

While privacy concerns are not the intent of this paper, creepy is worth noting as a project centered around embedded metadata that has received much attention as of late. That and the iPhone brouhaha also underscore the great need for understanding and being aware of the existence and potential uses (or misuses) of automatically generated embedded metadata.

For those charged with managing collections that include born digital media, awareness of and support for embedded metadata is imperative. Embedded metadata is an aid to archives and conservators in the digital age for verifying authenticity, integrity and provenance of files. It also enables increased accessibility and administrative capabilities. Practically speaking, to ignore embedded metadata is to effectively de-catalog an asset. Metadata capture has long been a resource intensive and challenging proposition for archives. The unprecedented rate of growth

24 Creepy. 2011. Creepy Website: http://ilektrojohn.github.com/creepy/ Consulted 20 May 2011

25 Arthur, Charles. 20 April 2011. 'iPhone keeps record of everywhere you go.' guardian.co.uk. http://www.guardian.co.uk/technology/2011/apr/20/iphone-tracking-prompts-privacy-fears Consulted 20 May 2011.

in audiovisual content production that has taken place in the past decade creates challenges on a completely different order of magnitude. However, with the increased utilization of embedded metadata by systems that automatically populate files with technical, structural, descriptive, and administrative metadata there lies new potential for its efficient capture and use, greatly reducing challenges related to both quantity and quality of metadata.

Tool development

After FADGI established that embedding a core set of metadata in WAVE files was of interest, they needed to decide where to embed the metadata within the file. A study was commissioned and performed by AudioVisual Preservation Solutions exploring and comparing the options for embedding the FADGI proposed metadata, resulting in a report and recommendations.[26] The table seen in Figure 6 below is an excerpt from this report and shows an overview of the comparative analysis performed on the embedded metadata standards reviewed.

Chunk	Size	Definition	Adoption	Authority	Extensibility	Storage
bext	Highly Limited	Highly Limited	High	EBU[xii]	None	Must be before data chunk, at the head of the file.
LIST INFO	Flexible	Limited	Somewhat High	Microsoft[xiii]	Unclear[xiv]	Must be before data chunk, at the head of the file.
iXML	Highly Flexible	Limited, but Extensible	Moderate[xv]	Collection of corporations, website maintained by Gallery	High, may be expanded as needed (registration encouraged)	May appear in any order with the other chunks of the RIFF structure
XMP	Highly Flexible	Somewhat limited, but extensible	In Development within Adobe Products.	Adobe	High, may be expanded as needed (best practices provided)	May appear in any order with the other chunks of the RIFF structure
aXML	Highly Flexible	Highly Flexible	Not commercially available. Apparent internal custom uses within organizations.	EBU[xvi]	Very High	May appear in any order with the other chunks of the RIFF structure, requires the file to meet BWF specifications

Figure 6: Table from page 17 of the referenced report. It should be noted that iXML is currently going through the standardization process within the Audio Engineering Society.

Using this report, FADGI decided to utilize a combination of bext and LIST INFO chunks to meet their needs. Their decisions regarding what metadata to embed and where to embed it are detailed in a document published on the FADGI website.[27]

As a follow-up activity, AudioVisual Preservation Solutions was commissioned by FADGI to develop a free, open source tool that would allow embedding, editing and exporting of metadata within WAVE files. This tool was named BWF MetaEdit and can be found for download at http://sourceforge.net/projects/bwfmetaedit/

Features of BWF MetaEdit include:

26 AudioVisual Preservation Solutions. 2009. Task 5.4: Assess Options for Embedding Metadata in WAVE Files and Plan the Audio Metadata File Header Tool Development Project: Assessment Report and Initial Recommendations.
Federal Agencies Audio Visual Digitization Working Group, Washington D.C. http://www.digitizationguidelines.gov/audio-visual/documents/AVPS_Audio_Metadata_Overview_090612.pdf Consulted 20 May 2011.

27 Federal Agencies Audio-Visual Working Group. 2009. Embedding Metadata in Digital Audio Files: Guideline for Federal Agency Use of Broadcast WAVE Files. http://www.digitizationguidelines.gov/audio-visual/documents/Embed_Guideline_090915r.pdf Consulted 20 May 2011.

- Import, edit, embed, and export specified metadata elements in WAVE audio files
- Batch and individual operation
- Export technical metadata from Format Chunks and minimal metadata from bext and INFO chunks as comma-separated values and/or XML, across a set of files or from individual files
- Evaluate, verify and embed MD5 checksums, as applied to the WAVE file's data chunk (audio bitstream only)
- Enforce specifications developed by the Federal Agencies Audio-Visual Working Group,[28] as well as specifications from the European Broadcasting Union (EBU), Microsoft, and IBM
- Report certain errors in the construction of WAVE files
- Interface through command line and GUI, for Windows/PC, Macintosh OS, Linux. (Full list of OS/interface options reviewable at SourceForge)

Aside from offering capabilities beyond other available tools, BWF MetaEdit is a metadata-centric tool designed to change the landscape of how organizations work with embedded metadata in WAVE files. It is a lightweight, cross-platform tool that can be deployed throughout an organization and used by all stakeholders in the lifecycle of an audio object. Capabilities that were once restricted to specialized audio-centric software usually found only in the audio studio are now made available to everyone, greatly optimizing expertise, increasing efficiency and improving quality assurance of embedded metadata in WAVE files.

Putting embedded metadata to the test

With the new availability of a tool like BWF MetaEdit, AudioVisual Preservation Solutions spearheaded a study in 2010 on behalf of the Association for Recorded Sound Collections Technical Committee (ARSC TC), evaluating the support for embedded metadata within and across a variety of audio recording software applications. The study sought to answer two primary questions:

1. How well does embedded metadata persist, and is its integrity maintained, within any given file as it is handled by various applications over time?
2. How well is embedded metadata handled during the process of creating a derivative?

Three tests, described below, were designed for this study, each one consisting of a test method and reference files.

1. Interoperability and Semantic Shifts: This evaluation uses a reference WAVE file containing extensive embedded metadata within the bext, LIST-INFO, axml, XMP and iXML chunks. The reference WAVE file is opened in a number of software applications to evaluate which fields are displayed in the application's interface. In addition to this, any semantic shifts are documented. Semantic shifts are defined, here, as occurring when an application displays a field's value using a field name that differs from the intent of the original field. As an example: if an application presented the value in the LIST-INFO chunk field labeled "itch" (the term for the technician who digitized the audio) as a field now labeled "artist," this would be considered a semantic shift. It should be emphasized that this test analyzes metadata display only.

2. Persistence and Integrity Through Editing Operations: A four-part test, this evaluation considers how various applications handle embedded metadata when basic metadata and audio editing operations are performed and the file is saved. The first two subtests analyze the results of editing and adding embedded metadata and saving the file.

28 Federal Agencies Audio-Visual Working Group. 2009. Embedding Metadata in Digital Audio Files: Guideline for Federal Agency Use of Broadcast WAVE Files

The third sub-test analyzes the results of performing an audio edit and saving the file. The final sub-test analyzes the results of simply performing the "save as" function. The primary focus for evaluation in all tests is identifying whether existing metadata persists unaltered.

a. Impact of Editing Existing Chunks: This test analyzes the results of editing embedded metadata and saving the file.
b. Impact on Existing Chunks when Creating New Chunks: The test analyzes the impact to existing chunks in a file when new chunks are added and the file is saved.
c. Impact on Metadata of Audio-Only Editing: This test analyzes the results of performing an audio edit and saving the file.
d. Impact on Metadata of 'Save As' Function: This test analyzes the results of performing the "save as" function.

3. Persistence and Integrity Through Derivative Creation: This evaluation tests how various applications handle embedded metadata, when creating a derivative file from a WAVE file. Target derivative file formats tested in the ARSC study included: MP3, FLAC, and WAVE.

Results from this study demonstrated that few of the standard metadata chunks are supported in their entirety by any software application. Rather, applications tend to display and provide access to selected fields of their choosing from each chunk standard. In general, the Broadcast Wave Format bext chunk is the most widely supported, followed by selected fields within the LIST-INFO chunk. Least supported were the XML-based chunks: there was some support for selected fields within iXML, but no support for axml, and support for XMP only by the its creator, Adobe.

Most troubling were the findings associated with application metadata management. According to our findings, it seems to be the rule rather than the exception for applications to automatically *erase* chunks and fields that they do not support after common user actions such as metadata or audio editing are performed. Embedded metadata does not persist nor is its integrity maintained consistently when the same file is used across the audio software applications studied.

These issues have major implications for the use of embedded metadata over time and across workflows. The findings of this study raise serious concerns, particularly for the archiving and preservation communities who rely on embedded metadata for interpretation and management of digital files representing preserved content into the future.

Next Steps

There are two things that readers should NOT take away from this article:

1. The situation is so bad that I shouldn't worry about embedded metadata in WAVE files.
2. I'll wait until it is figured out to do anything.

As mentioned earlier, caretakers of collections ignore embedded metadata at the risk of sacrificing knowledge and utility for themselves and their users. It is important to recognize the current challenging environment so that you are able to navigate it accordingly. While the ARSC TC findings are unsettling on their face, the field of photography offers a hopeful and valuable precedent for successful collaboration between software developers, manufacturers and users in support of embedded metadata generation and persistence. In particular, the Society of American Archivist's (SAA) Photo Metadata Project[29] is an

29 SAA Photo Metadata Project: http://www.photometadata.org/ Consulted 20 May 2011

impressive initiative and serves as an excellent model to follow. It is the author's opinion that the findings of the ARSC TC study are the result of a lack of communication between these stakeholders in the audio industry. With increased awareness and communication,ac the most troubling of these issues, such as erasure of unsupported metadata, are relatively easy ones to solve. At the time of this writing, the ARSC TC Metadata Study Report is approaching publication via the ARSC website.[30] This study helps quantify the issues and will be an effective aid in communication between the various stakeholders regarding embedded metadata support, management and behaviors within applications handling audio files. For readers that are able to contribute to, and participate in, stakeholder discussions, we ask that you please contact this author to discuss the issues further.

More immediately, you can use BWF MetaEdit and the resources produced from the ARSC TC metadata study to put your new awareness of the issues to work by incorporating new quality control procedures and routines into your audio file workflows. Audio "metadata paths" should be considered and tested in the same manner that audio signal paths are. Aside from utilizing the accessibility of BWF MetaEdit to do more rigorous quality assurance, routine integrity testing is also recommended. The ARSC TC study produced three test methods and associated sets of reference files which, at the time of this writing will be available for download from the ARSC website shortly. In combination with BWF MetaEdit, organizations can use the reference files to test their metadata path when configuring systems and as part of routine maintenance and testing.

The significance and pervasiveness of embedded metadata as an integral part of the audio object demands the attention of those who are charged with managing and caring for file-based audio collections. Over the past decade in the transition to the digital domain the archival community often questioned the implications of this shift from physical media to files. The evolution of our collective awareness and toolset for working with embedded metadata, and grappling with how it fits into the information architecture, serves as a poignant example of the ways in which our understanding and practices must change in order to meet preservation principles and provide meaningful long-term access to collections.

30 ARSC Website: http://www.arsc-audio.org/ Consulted 20 May 2011

THE COLLECTOR'S GUIDE TO VICTOR RECORDS by Michael W. Sherman in collaboration with Kurt R. Nauck III. Revised Second Edition. 288 pages, 800 illustrations. Monarch Record Enterprises, Tutti, CA. 2010

Reviewed by Richard Green, Library and Archives Canada

Now I know we are all supposed to be happy readers, spending long fruitful hours in contented company with our iPads, Kobos, and Kindles, but, really, when you have a book as lovely as the new revised and expanded edition of *The Collector's Guide to Victor Records* in your hands, in hard cover for this reviewer, an e-book seems, well, kind of dull. Sort of like listening to an MP3 when you could have a warm sounding LP. But I guess I am just an analogue kind-of-guy. Which is fortunate because, when it comes to books about the pre-digital era of recording, in particular the record labels that dominated the 78-rpm decades, this book sets the standard. It is detailed, thorough, well-written, professional and a delight for anyone, or any collection, with an interest in, and passion for, 78-rpm discs. Indeed, anyone who is contemplating a research project on record labels from any era or any country should consult this book as a model. Michael W. Sherman, and his collaborator, long-time IASA member, Kurt Nauck are to be congratulated on a fine publication.

The first edition, published in 1995, established an approach to studying the operations of record companies through the documentation of the labels of the records themselves. The revised second edition maintains this method which was, and is, a perfect compliment to discographies and corporate histories. By examining the evolution of labels, and providing images, the authors link the discs to changes in the music industry and, in this case, the rise and progress of arguably the most important label in American recording history, the Victor Company. From its roots with Berliner Company in 1886, through the Victor Talking Machine Company, to RCA Victor and the end of the 78-rpm disc in 1958, plus the various incarnations and labels in-between, the changes in Victor labels, major, minor, and almost indecipherable are covered. By following the sequence of record labels, and the often subtle changes on the labels, it is possible, using this book, to accurately date the pressings of Victor recordings, establish probable recording dates, and document the changes in technology and industry priorities throughout the decades. Others, before and since, have used this approach, in whole or in part, but few have put it together, and presented it as beautifully as these authors.

The second edition doesn't provide much new textual information on the Victor Company's history. It does however have many modifications, refinements and improvements over the first edition. The book format is larger (7"x 10" instead of 6" x 9", 19 cm x 26 cm instead of 15 cm x 23). There are more pages (288 vs. 176). The images, over 800, take advantage of high resolution digital technology, and are now all in colour and are clearer and sharper. Combined with quality paper for the printing, the overall impact is superior and the image detail, for example, the early engraved Berliners, the fine details for the type-face used in the Batwing labels, and the patent information for various labels, is excellent. Measurements for disc and label size are provided in both imperial and metric. Anyone who has worked with 78s has to appreciate the fine eye that distinguished and described the minute details that differentiate many of these labels. This is truly a labour of love, or perhaps an obsession?

Sections on early Berliners, celebrity recordings, and the post Second World War recordings have been greatly expanded. The graphs detailing release dates are better laid out with the addition of colour adding to the ease of use. The section on specialty labels and other series has grown from twenty pages to ninety and provides much greater coverage of Foreign and Ethnic recordings (a plus for archives in other countries), Production and Marketing releases, and Broadcasting and Movie discs. The variety of labels depicted illustrates the range of activities undertaken by the Victor Company. The contribution of many collectors and researchers to these sections is acknowledged. The project has no doubt benefited from the thousands of discs that pass through Kurt Nauck's hands every year.

The book contains several very useful appendices including a look at some of Victor's printed materials (a possible research project in itself?), some summary tables, an annotated bibliography, footnotes (new for this edition), and an index (an essential for such a project). The Preface and Introduction provide an important discussion of the project's background, basic labels, recording dates, pressing dates, and concludes with some very insightful comments on the nature of collecting. As one of my research mentors used to say, "You won't know what the book is about unless you read the introduction," so read the introduction.

The *Collector's Guide*, with its superb history of the Victor labels, compliments the Encyclopedic Discography of Victor Recordings http://victor.library.ucsb.edu/ , currently being produced online at the University of California at Santa Barbara under the direction of IASA members Sam Brylawski and David Seubert, and the Library of Congress' National Jukebox http://www.loc.gov/jukebox/ guided by IASA's Gene DeAnna. The Victor Discography documents the recording events that are described on the Victor labels and the National Jukebox brings the recording sessions and the labels to life by adding the music. Sometimes archivists, librarians and discographers, in the quest for descriptive detail, forget the music. The introduction to *The Collector's Guide* quotes Victor discographer John Bolig as saying, *Whatever the label may say, the grooves speak louder*. John is a wise man and the authors of *The Collector's Guide* are even wiser by acknowledging the connection.

With the 2nd Edition, Michael W. Sherman and his collaborator, Kurt R. Nauck III, have set a new standard for discographic research in general and for record label research in particular that others must now aspire to. Hopefully his work will also serve as an inspiration for others undertaking various research projects. Maybe it will lead some to look through their collections to see if there is that special label that this book missed. I am sure the authors would welcome corrections and additions for that is what research is all about. So, if you have Victor 78s in your collection, are interested in the history of the recording industry, or are just looking for a good book, give your collection and yourself a real treat and purchase the 2nd edition of *The Collector's Guide to Victor Records*. You won't regret it.

The Collector's Guide to Victor Records can be ordered through Kurt Nauck at www.78rpm.com where you can also view some sample pages.

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Layout by Smallgoodthing, London, UK. Printed by Bellsway Print, Orpington, UK.

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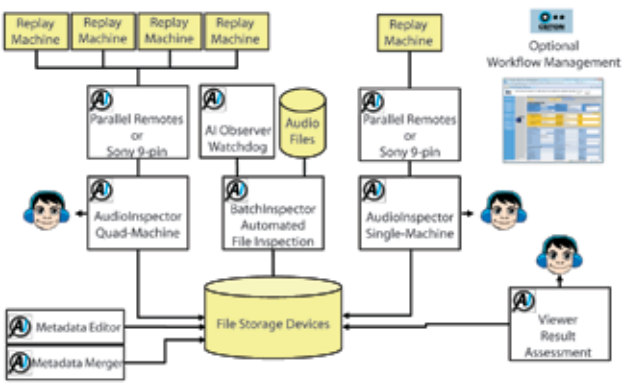

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