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Not Just Paper: Enhancement of Archive Cultural Heritage

Abstract: Oral archives and digital technologies have gone hand-in-hand for a very long time. Both sides benefit from this interdisciplinary junction: technology enhances the preservation and diffusion of oral materials, while exploiting them to develop cutting-edge tools for their treatment. This chapter deals with an Italian instantiation of this mutual relationship: the *Archivio Vi.Vo.* project. Offering innovative solutions concerning metadata, audio restoration, description, and access, Archivio Vi.Vo. aims to build an online platform to host the oral archives from Tuscany. The project is powered by CLARIN-IT, which guarantees its compliance with standards and offers resources for data access and discoverability. Archivio Vi.Vo. has not been built from scratch: it is instead a cross-fertilization of previous initiatives and research projects (e.g., the *Gra.fo* project). Moreover, the chapter presents the related, contemporary work of a multidisciplinary group striving to synthesize a Vademecum for future generations of oral

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archive researchers. Lastly, a brief list of tentative ideas for future developments of the Archivio Vi.Vo. platform will be presented.

Keywords: digital oral archive, research infrastructures, archival heritage, models for digital preservation

1 Introduction

The application of digital technologies to analogue oral archives demonstrates tremendous benefits from the point of view of accessibility, reusability, and cost reduction for their management, as well as cultural and social inclusion. For this reason, researchers of oral archives have always felt the urge to tap into the latest innovations, while at the same time contributing to novel development processes. Almost contemporaneously with the popularization of the first home computers, Quebecker sociologist Nicole Gagnon (1981–1982) reflected on the usefulness of databanks to improve the structure of, and the accessibility to, oral archives. A few years later, at the end of the 1980s, the Alaskan cross-disciplinary Jukebox project – which involved oral historians and information technologists collaborating for what was probably the first time (Schneider 2013: 302) – worked hand-in-hand with Apple to develop a multimedia workstation showcasing digitized oral archives, transcriptions, and photographs, a project described as "a fantastic jump into space age technology" (Lake 1991: 30).

Fast forward to more recent times, and we observe that the relationship between oral archive projects and technology is still sound and fertile, inspiring several research goals, which can be roughly grouped into two categories. On the one hand, working with oral archives may encourage the envisioning of new technologies for the treatment of oral materials (for a general introduction on the programming of language technologies, see Ljubešić et al. 2022). Software concerning speech transcription is a clear example of this. To name a few, the Origins of New Zealand English project, which dealt with the linguistic analysis of a 1,000-hour oral archive covering the whole history of this variety, led to the development of the LaBB-CAT software, a renowned corpus building and annotation tool (Fromont and Hay 2012). Moreover, a project focusing on the disclosing of the historical archive of the Czech Radio encouraged the creation of speech-to-text software for the Czech and Slovak languages (Nouza et al. 2014) and highlighted the potential of oral repositories in the context of under-resourced idioms (see also Hennelly et al. 2022 for the South African context). Of course, linguistics was not the only field benefiting from this cross-disciplinary encounter. For example, in order to enrich the searchability of the ethnomusicological archive of the Parisian Musée de l'Homme, the DIADEMS

project invented novel tools for musicological analysis such as, among others, an automatic instrument classifier (Fillon et al. 2014).

On the other hand, oral archive projects adapted existing technologies (and developed new systems) to conceive innovative ways of experiencing sound materials. The INTIMAL project is a recent straightforward instance of this trend. Through the elaboration of an oral archive concerning the narratives from Colombian Women in the diaspora, INTIMAL created embodied systems of relational listening by exploiting, among other tools, motion capture technologies (Alarcón et al. 2019). Oral archives can also be put to use to draw engaging tourist itineraries. In the context of the augmented cultural heritage paradigm, the Italian Gra.fo project (see below, Section 2) conducted an evaluation of the benefits of using the contents of Tuscan oral archives in an augmented reality mobile application based on spatial technologies (Pozzebon, Biliotti, and Calamai 2016).

Indeed, new technologies also lead to new complexities and hurdles for oral archivists. Digitization processes pose various challenges if we are to avoid bad transactions of information and data loss. In addition, the dramatic diffusion potential of web-based archives entails a renewed attention to legal issues, including authorship, ownership, and privacy (see, e.g., Calamai, Ginouvès, and Bertinetto 2016).

In this chapter, a recent Italian contribution to this international cross-fertilization of ideas and methods between oral archivists, linguists and technologists is presented. The remainder of the text is structured as follows. The technological aspects of the *Archivio Vi.Vo.* project, which aims at building a web infrastructure to host Tuscan oral archives while proposing novel solutions concerning metadata, audio restoration, access, and legal issues, are described in detail in Section 3. In this section, we also substantiate how the outcomes of a regional project can be significantly enhanced in the CLARIN context. Archivio Vi.Vo. is introduced by recounting the development of its predecessor, the Gra.fo project (Section 2), and followed by a short presentation of a related Italian initiative: the building of a Vademecum for the next generations of scholars (Section 4). Lastly (in Section 5), we conclude with some ideas for future extensions of the project goals.

2 Before CLARIN-IT: Oral archives in Tuscany

Rather a long tradition characterizes the research on Tuscan oral archives. As early as the 1980s, Giovanni Contini at the Soprintendenza Archivistica e Bibliografica della Toscana started collecting oral and audio-visual archives focused on the economic and manufacturing history of Tuscany. In 1993 the very first Italian

handbook dealing with oral archives, their management, and their description came to light (Contini and Martini 1993). In the same period, still in Tuscany, at Siena University, a close cooperation among researchers in anthropology (Pietro Clemente) and linguistics (Luciano Giannelli) yielded seminal works such as Valeria Di Piazza and Dina Mugnaini's *Io so' nata a Santa Lucia: Il racconto autobiografico di una donna toscana tra mondo contadino e società d'oggi* (1988). The transcription of a very long oral narration by an old Tuscan peasant was prefaced by Pietro Clemente in *Autobiografie al magnetofono* (Autobiographies on the tape recorder) and by Luciano Giannelli in *Il testo come documento di lingua: Problemi di rappresentazione* (The text as a linguistic document: Issues of representation), which offered an unparalleled reflection both on the relationship between written text and oral source, and on how to represent vernacular speech on paper, trying to find a balance between authenticity and readability. This experience is still a reference point for scholars dealing with the transcription of oral sources, no matter what field of knowledge they come from.

It is against this background that in 2007 Pietro Clemente edited (with A. Andreini) the first census of Tuscan oral archives and offered a detailed overview of the huge number of audio cassettes, open reel recordings, and VHS tapes scattered around Tuscany (Andreini and Clemente 2007). The census discovered 124 archives (every single archive is described according to a set of metadata), for a total of 82,450 video documents and 32,622 audio documents (Andreini 2007: 64–65). Such meritorious work, albeit somewhat incomplete (since archives collected by linguists were not considered), emphasized several crucial aspects: the huge amount of analogue data, the scattering of archives, and (in the great majority of cases) their inaccessibility. In this context of renewed interest in oral archives, the *Grammo-foni. Le soffitte della voce* (Gra.fo) project emerged.

Gra.fo was a two-year project jointly conducted by the Scuola Normale Superiore, Pisa, and the University of Siena (Regione Toscana PAR FAS 2007-13). Its purposes were as follows: to discover, digitalize, catalogue, and partially transcribe oral documents (e.g., oral biographies, ethno-texts, linguistic questionnaires, and oral literature) collected within the Tuscan territory. Gra.fo thus aimed to provide first-hand documentation of Tuscan speech varieties and Tuscan oral documents from the early 1960s to the present. The project involved different stages, from fostering the level of awareness on the importance of preserving this valuable product of cultural heritage, to contacting the oral recordings' owners and co-signing legal agreements; from collecting, digitizing, and cataloguing the audio materials, to finally implementing a downloadable online catalogue (which provided the opportunity to discover oral texts known, until now, to a very limited number of possible users).

At the beginning of the project, an updated census of Tuscan oral archives was made: already existing censuses (namely Andreini and Clemente 2007; Benedetti 2002; and Barrera, Martini, and Mulè 1993) were used and integrated with information about oral archives collected for linguistic and dialectological research purposes, such as Carta dei Dialetti Italiani, Atlante Lessicale Toscano, and Vocabolario del Fiorentino Contemporaneo. A priority list was defined and the sound archives' owners were directly contacted. The research group met those who accepted the invitation to join the project, in order to collect their archives and sign legal agreements for the temporary borrowing and the dissemination of their materials. In addition, the owners of the archives with no proper bibliography or accompanying material were interviewed so that they could explain the motivation and aims of their research. Indeed, unlike other kinds of materials, oral documents are often obscure objects: usually, the motivation behind them is clear only to the researcher(s) who collected them. Such interviews, called "Tell something about your archive", are crucial as they provide cataloguers with the key for interpreting and describing the archive, and the users with an appropriate guide for understanding it.

Once the audio materials were gathered into the Gra.fo laboratory (at the time hosted in the Linguistic Laboratory of Scuola Normale Superiore), the conservation protocol took place. Open-source software for the preservation and cataloguing of sound archives was developed within the project. Such software allowed the cataloguers to describe both the archives (including their subdivisions) and the single oral documents. During the project, nearly 3,000 hours of speech recordings stemming from around 30 oral archives collected by scholars and amateurs in the Tuscan territory were digitized.

A complex project like Gra.fo required the definition of procedures that do not figure in the available literature. Dealing with extremely heterogeneous archives from different areas, the Gra.fo working group faced a number of critical issues, such as:

- philological issues (i.e., the relationship between the carrier and the document; the proper treatment of documents containing other documents; the discrepancies between the arrangement imposed on to the archive by its owners and the one adopted within Gra.fo);
- legal and ethical issues (i.e., authorship and ownership in oral archives, legal treatment of confidential information).

The project officially ended in 2014, but not all the digitized archives were catalogued; therefore, a subsequent smaller research action was pursued at Siena University (Voci da ascoltare project), with the aim of cataloguing the Carta dei dialetti italiani archive (limited to Tuscan surveys).

In the meantime, in 2015, while researchers were beginning to explore the potential of the Gra.fo materials for linguistic analysis (Calamai and Biliotti 2017), Italy became a member of CLARIN ERIC, and Italian researchers got to know the world of CLARIN better (Monachini and Frontini 2016; Nicolas et al. 2017). Some feasibility studies were conducted in order to verify how the Gra.fo archive could enter the Italian national CLARIN repository (Calamai and Frontini 2016, 2018; Frontini and Calamai 2018). In parallel, an in-depth examination of the legal questions involved in the dissemination of oral archives was carried out by the CLARIN Legal and Ethical Issues committee (Calamai et al. 2018).

3 CLARIN-IT and Archivio Vi.Vo.

The cross-fertilization between the experience gained during the Gra.fo project and a better awareness of the added value provided by the CLARIN infrastructure to the research communities of speech scientists and oral historians gave rise to the Archivio Vi.Vo. project (2019–2021), supported by Regione Toscana, with the aim of building a model and a system for cataloguing, accessing, preserving, and sharing oral archives. The following partners were involved: Università degli Studi di Siena; Soprintendenza Archivistica e Bibliografica della Toscana; Istituto di Linguistica Computazionale "A. Zampolli" del Consiglio Nazionale delle Ricerche (ILC-CNR) and CLARIN-IT; and Unione dei Comuni del Casentino.

Rather than produce the umpteenth project on a specific genre of audio archive, it was decided to concentrate all the team's efforts on building a system designed to be interoperable and compliant with the CLARIN-IT infrastructure, with metadata harmonized and deposited in the CLARIN repository (Monachini and Frontini 2016). Within Archivio Vi.Vo., the presence of Soprintendenza Toscana guarantees the accountability of the project, while CLARIN-IT assures the infrastructure and the compliance with CLARIN standards for long term-preservation and sustainability (Stamuli 2019; Calamai et al. 2021). This latter aspect is far from trivial, if one considers that the Gra.fo archives are no longer accessible via the web and the web portal appears to be unmaintained. In this respect, creating both an infrastructure and a model design for managing oral archives is expected to address a risk which appears to be more common than people know: that is, the fact that the life of a research project – no matter how groundbreaking it might be – is associated with individual working lives, with all the consequences that entails for future reuse of research data (see the sustainability problem discussed in Broeder and Odijk 2022). Accessing and sharing data

also opens up legal issues: the Archivio Vi.Vo. project is aiming to provide a legal framework for the reuse of oral archives.

The development of such an infrastructure requires a complex use case for its validation. This is the case of the oral archive of Caterina Bueno (San Domenico di Fiesole, IT, 2 April 1943 – Florence, IT, 16 July 2007), an important Italian folk singer who brought together many folk songs from Tuscany and central Italy that had been orally passed down from one generation to the next, up to the 20th century, when this centuries-old tradition started to vanish (Calamai et al. 2021). The archive was composed of about 500 analogue carriers on magnetic tape (audio open-reel tapes and audio cassettes) and was digitized during the Gra.fo project. The material consists of about 700 hours of very heterogeneous audio recordings (interviews, folk songs, field recordings, concerts, etc.). Their very poor condition and complex archival history make this case study very challenging, providing the opportunity to develop a methodology able to manage complex audio recordings. This case involves open-reel tapes recorded with different speeds and track-head configurations, which are managed by the Archivio Vi.Vo.

The overall infrastructure will exploit the facilities of the Consortium GARR, the Italian Gruppo per l'Armonizzazione delle Reti della Ricerca,[1] the national high-performance network infrastructure that delivers advanced services to the Italian academic and scientific community. The Archivio Vi.Vo. platform is composed of two main parts: a back-office platform for managing, preserving, restoring, and cataloguing oral archives, and an access interface for searching and listening to oral sources. The former is an advanced platform that takes into account the peculiarities of oral sources stored in analogue recordings.

The Archivio Vi.Vo. platform makes two main advances: (a) a new metadata structure, and (b) innovative web interfaces, including advanced functionalities for the restoration and description of audio recordings, typically integrated only into professional desktop applications. The software is designed as a wizard that helps researchers and cataloguers who do not necessarily have specific knowledge in audio restoration. At the time of writing, the metadata structure and main interfaces are already developed and undergoing testing, but not yet integrated in the overall workflow.

1 https://www.garr.it/ (accessed 29 June 2021).

3.1 The Archivio Vi.Vo. model

In what follows, the workflow is briefly presented, with particular attention to the computer processing of the digital constructs that are temporarily created during the analysis. This process aims to link together two main digital constructs, the first of which being the *preservation copy*. This consists of an organized set of data and metadata that groups together all the information represented by the source document, stored and maintained as a digital preservation master (Bressan and Canazza 2013). The degradation process of the original analogue carrier can be slowed down but not stopped. For this reason, these copies are necessary for avoiding the degradation of the carrier (each time it is played back) and accessing the recorded content as soon as the original source is no longer playable or accessible. Therefore, its scope is concerned with long-term preservation. It is the result of the digitization process and is composed of a set of high-quality multimedia files obtained during the digitization process. In the case of open-reel tapes, they are: (a) audio files containing the signal; (b) a set of photos of carrier, container, and (if any) additional documents associated with the audio recordings; and (c) (optional) video of the tape flowing into the reading head of a tape recorder (Pretto et al. 2019).

The other relevant digital construct refers to the content and is the output of an interpretative analysis. The relationship between carrier and content appears to be rather complex and domain-dependent: that is, every discipline dealing with oral sources tends to produce its own taxonomy (Calamai, Biliotti, and Bertinetto 2014; Stamuli 2019). In American oral history tradition, for instance, the content pertaining to the same communicative event, made up of a unit of time and place, is defined as an "intellectual unit". In the cataloguing process, it is fundamental "to distinguish between the physical and the intellectual units, and to keep track of the relationships among the parts" (MacKay 2007: 16). It happens very often that in the same preservation copy (derived by the digitization of a single carrier) more than one communicative event is recorded. For example, in Bueno's archive, we found frequent instances of single carriers containing concerts, field recordings, and music compilations. We thus have to make a distinction between the digital preservation masters and their diverse contents. Conversely, a single event (e.g., an interview) can be recorded in two or even more audio recordings (therefore, stored in multiple preservation copies). The preservation copies and the documents that are created through the analysis of their contents are stored in two distinct archives linked together (the latter

being compliant with the hierarchical structure of the General International Standard Archival Description ISAD[G][2]).

Several working phases are envisaged during the creation of the event-based documents from the preservation copies, thus establishing a series of subsidiary digital constructs, such as *group*, *container,* and *clip*. These objects serve the purpose of keeping track of the restoration and description steps needed to circumscribe a document related to a single event. Firstly, our preservation copies may be actually composed of multiple audio files (especially in case of different speed standards: see Pretto et al. 2020). These files are organized into groups, which are specified in the metadata structure of the preservation copies. A very straightforward example of this need is the creation of two separate mono files (one for each channel) during the digitization of a stereo recording. These files need to be grouped in a single set so they can be listened to correctly, as if they were a single audio file. This circumstance must be managed for the correct restoration, analysis, and access of the content. The files that need to be listened to together are part of the same group. At the moment, the configurations managed by the platform are: mono (one channel), stereo (stored either in a single stereo file or two mono files), quadraphonic files (stored either in a single quadraphonic file or four mono files). In other words, the files obtained during the same "reading" of a tape are stored together in a *group*.

Some parts of a group could have digitization errors. In this case, the correct solution is a new digitization of the tape. In some cases, a new digitization cannot be performed, but some digitization errors can be restored in order to at least partially recover the original content. Via an innovative web interface (see Figure 1), the user can divide a group into intervals that can be independently restored. These intervals are named *containers* and can also be composed of a subset of the channels of the group. The restoration features are the change of speed and equalization, following the workflow proposed in Pretto et al. (2021), and the management of the inverted tracks (Bressan et al. 2021). All the containers will be separated into different files and if necessary restored. In the case of multiple digitizations of the same tape at different speeds, some parts can be discarded.

After the restoration phase, each container will be analysed and described by the cataloguer and/or researcher through a description interface (Figure 2). The aim of this step is the detection of parts related to different communicative events (interviews, concerts, etc.). Each part is named *clip* and is divided into a separate audio file. As its name implies, the description interface allows for the

2 https://www.ica.org/en/isadg-general-international-standard-archival-description-second-edition (accessed 19 March 2022).

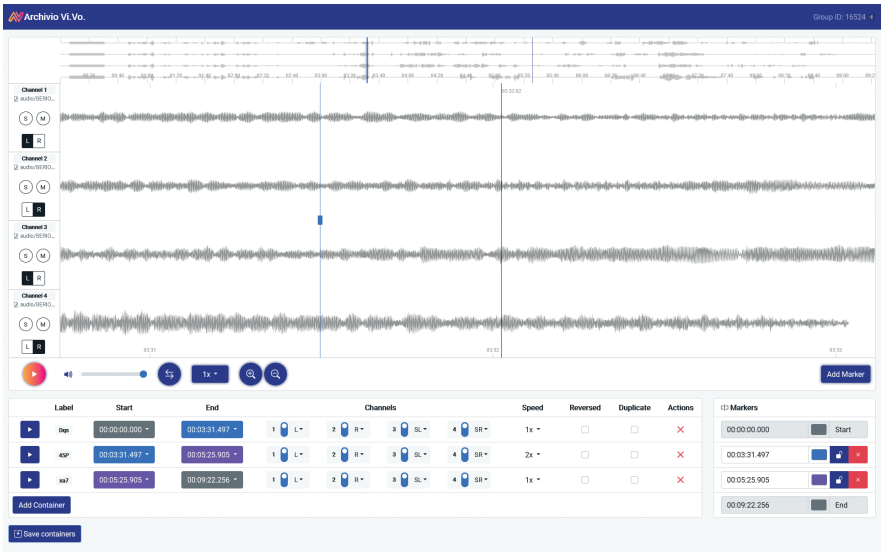

Figure 1: Restoration interface of the Archivio Vi.Vo. platform.

individuation of the clips comprising single content units, and also allows them to be recounted at a fine-grained level of analysis. In this phase, each clip will be described in one or more *segments*. Each segment will be constituted by a time interval and a description of the content, which will be used by researchers to search for an oral document. Unlike containers and clips, the segments will not be separated into different files. In other words, the segments are not separate digital objects, but simple markers of the beginning and the end of a subcategory of events (e.g., the segment of a single song during a concert). The descriptions of the segments compose the *regesto* of each clip. A set of ordered clips will constitute the final document. These event-based documents will be accessible through an interface that will include all the metadata and the ordered list of clips as shown in Figure 3. In the system, the creation of containers, clips, and segments might be skipped in the case of a more straightforward relationship between carrier and content, while the creation of a group is mandatory.

At the moment, the archive consists of 468 *preservation copies* (only a few audio recordings are not included) of 381 audio cassettes and 87 open reel-tapes. There are nearly 600 related oral documents. The goal of the project is to make most of the oral documents available for listening through an access interface open to the public, while the actual download of the files will be behind a federated access barrier or on demand. The documents' metadata will also be accessible via the CLARIN Virtual Language Observatory (VLO; Windhouwer and Goosen 2022).

Figure 2: Description interface of the Archivio Vi.Vo. project.

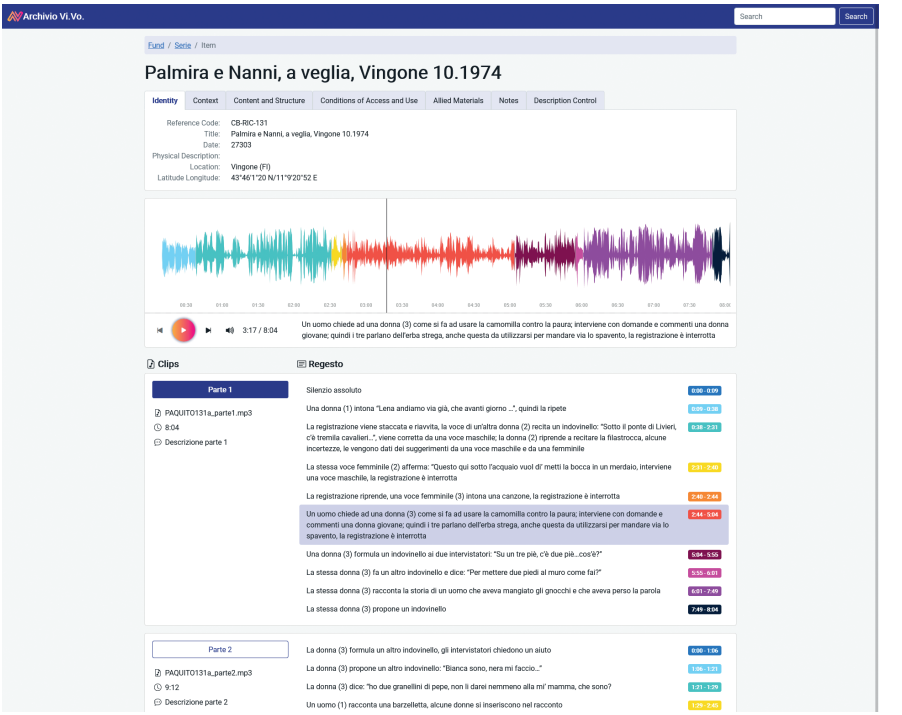

Figure 3: Access interface of the Archivio Vi.Vo. project.

4 The Vademecum experience: Next generation archives

Connected to Archivio Vi.Vo., CLARIN-IT representatives of Italian institutions and associations involved in protecting oral sources – namely, Maria Francesca Stamuli of the Soprintendenza Archivistica e Bibliografica della Toscana and Silvia Calamai of the Associazione Italiana di Scienze della Voce (AISV) – joined forces with the Associazione Italiana di Storia Orale (AISO, Alessandro Casellato) and promoted the "Vademecum for the treatment of oral sources".[3]

The Vademecum arises from the awareness that many oral archives produced in the past require an urgent safeguard action to prevent their irreversible deterioration. The initiative tries to provide a set of guidelines for those who deal with oral sources, such as researchers, archivists, librarians, and documentalists; it also offers conservators of oral archives some basic guidance on how to better carry out their work. The document aims to inform as well as sensitize researchers on the importance of properly creating, archiving, and preserving oral sources, as a prerequisite for the possibility of enhancing them and making them available to future scholars.

The original concept of the Vademecum came to light at the XV AISV Congress (Arezzo, Italy, 2019). About 100 participants attended the Conference, devoted exactly to oral archives. The Executive Director of CLARIN ERIC, Franciska de Jong, gave the keynote lecture "Spoken word archives as societal and cultural data". During the conference, special emphasis was placed on the legal aspects involved in collecting and (re)using audio archives, on how to assure the correct conservation and metadatation of archives, and on possible ways to promote a closer collaboration between linguists, speech scientists, speech technologists, and oral historians. At the final roundtable, presidents of both the AISV and AISO, together with representatives of national institutions, scholars, and representatives of tech companies, addressed many themes associated to the challenges of preserving, reusing, and sharing speech and oral archives collected for other purposes; legal and ethical issues were also touched upon with all the risks implied, as well as the issues of metadata, established standards, and best practices. The panellists all agreed that oral archives offer numerous opportunities for cross-fertilization and collaboration between communities, speech technologists, linguistic researchers, and social scientists (Piccardi, Ardolino and Calamai 2019).

3 http://www.archivi.beniculturali.it/images/pdf_articoli/news/2021/10_ottobre/27_Roma%20MIC/Vademecum_02_11_21.pdf (accessed 19 March 2022).

After the conference, a working group was created in the biennium 2019–2021: after several meetings online and in person a first version of the Vademecum was publicly presented during the UNESCO World Day for Audiovisual Heritage (27 October 2020). On that day, all the documents forming the Vademecum were made available for public review and comment, thus allowing academia, independent researchers, institutions and foundations, and the public at large to contribute to their revision and implementation.

The Vademecum consists of three basic pillars:

- production and description of oral sources (i.e., how to create, describe and make accessible an oral archive);
- conservation of oral archives (i.e., how to best safeguard the oral sources recorded in the past few decades, in consideration of their peculiar fragility);
- enhancement, use, and reuse of oral sources (i.e., the regulatory framework to keep in mind before searching where to deposit oral archives and how to share them).

The document continues and relaunches a tradition of intergenerational and interdisciplinary scientific comparison and exchange of best practices between institutions dealing with oral sources in Italy. Such experience led to the release of an updated version of the Vademecum during the UNESCO World Day of the subsequent year (27 October 2021). In the long and constructive process that resulted in the Vademecum, two relevant aspects deserve attention. Firstly, the plurality and the variety of the people involved in the process: for the very first time, very different stakeholders from different generations (from PhD students to retired scholars) have been working together. Members of the CLARIN-IT consortium, national institutions, and scientific associations have collaborated to offer a valuable manual for different types of users (from independent scholars, to small institutions, to academia). Not only did the writing of the Vademecum envision a public review phase, but several dissemination actions were also planned by the coordinators (Calamai, Casellato, Stamuli), in order to promote the Vademecum among the general public, independent researchers and communities engaged in public history movements (e.g., at Tricase in Puglia, with Liquilab and the Summer School of the History of Folk Tradition), PhD students (e.g., at Pisa University, and the University of Modena and Reggio Emilia), and different scientific communities (e.g., Analisi dell'Interazione e della Mediazione group). The Vademecum was also promoted at a supranational level during a CLARIN Café titled "How Not to Spill Coffee on Your Tapes: Best Practices for Preserving Oral Archives" (24 February 2021, organized as a joint collaboration between CLARIN ERIC and the SSHOC project).

5 Conclusion

In this chapter, we have expounded one of the most recent Italian developments in the long-standing relationship between the management of oral archives and the search for technological innovations: the Archivio Vi.Vo. project. This cross-disciplinary enterprise benefited hugely from the groundwork laid by previous Tuscan research on oral archives, as well as from the involvement and contribution of the Italian CLARIN consortium. Moreover, Archivio Vi.Vo. finds strength in contemporary Italian initiatives that are promoting oral archives to the next generation of researchers through a substantial effort of theoretical systematization and synthesis. Overall, this situation bodes well for the near future: as the Archivio Vi.Vo. project enters its final phases, we are beginning to gather together ideas concerning plausible directions for further developments. This concluding section is dedicated to a sneak peek beyond the current boundaries of Archivio Vi.Vo.

At least three developing areas can be envisaged: (a) user involvement, (b) legal aspects, and (c) technology and computational perspectives. Regarding (a), user involvement (see Draxler et al. 2022 for its importance in CLARIN), in Calamai et al. (2021), we explored the results of a questionnaire distributed through the mailing lists of various Italian research associations. The questionnaire investigated the needs of the potential users of the Archivio Vi.Vo. platform concerning, among other aspects, the searchability functionalities (see Pettersson and Borin 2022 for a similar preparatory inquiry). Our data showed that, overall, the search criterion by dialect/language was the least favoured in terms of perceived frequency of use and usefulness. However, correlation analyses underlined a strong countertrend concerning linguist respondents. Even though this pattern is conceptually unsurprising, it managed to stress the convenience of proposing personalized access options to researchers from different disciplinary backgrounds. Moreover, on a more general level, we are beginning to envision a major divide between the data visualization tools offered to researchers/professional archivists and to the general public. While the former category might be interested, for example, in the inspection of the hierarchical structure of the archive, this information might be regarded as cumbersome by the latter. For this reason, more engaging applications could be developed, such as interactive cartographic overviews of the places where the recordings were actually made. Indeed, georeferencing has always been a staple component of the oral archive/technology relationship (Lake 1991).

As for the legal issues (b), in Marra, Piccardi, and Calamai (2021), we tried to counter excessive risk aversion in the management and diffusion of a web-based oral archive by showing that not all the legal hurdles are equally threatening and that, while universal formulae for legal compliance are a mere chimera,

archivists should carefully inspect the nature of their materials and act accordingly. We substantiated this point by looking at our pilot archive: this being the Caterina Bueno collection of ethnomusicological nature, the resulting guidelines were very specific and far from able to cover all the needs of the future users of the Archivio Vi.Vo. platform. We are aware that web tools are being developed to help the research community deal with various legal aspects of data gathering and treatment (e.g., the CLARIN License Category Calculator: see Rodriguez-Doncel and Labropoulou 2015 for discussion; and the DARIAH ELDAH consent form wizard: Hannesschläger, Scholger, and Kuzman Šlogar 2020; for these tools, see also Kamocki, Kelli, and Lindén 2022). Along these lines, we are currently evaluating the feasibility of integrating an interactive legal pipeline in Archivio Vi.Vo., covering a wide range of research scenarios with specific reference to the Italian legal system and its interactions with the GDPR.

A last point concerns the technological perspective (c). In the course of the Archivio Vi.Vo. project, we saw a progressive growth of our knowledge concerning the oral documents contained in our pilot archive, that is, the Caterina Bueno collection. The contributions of researchers with diverse disciplinary backgrounds brought heterogeneous viewpoints to the table, which engendered enriching discussions on data treatment and description. Moreover, through the inspection of related archives and the discovery of new oral documents, we have gradually come to know the original gatherer of the materials better. We argued that this research process might have been of interest for the users of the archive. Collaborative research is a discursive endeavour, and documenting the various steps leading to a result (or to multiple interrelated solutions) promotes transparency and critical thinking. Because of this, we are exploring the idea of implementing versioning in Archivio Vi.Vo. (see e.g., Bürgermeister 2019). Through versioning, an oral archive can become dynamic and capable of recording inside its own structure the academic discussions revolving around its materials. Indeed, versioning is also a great way to improve data citation precision (see Hajič et al. 2022).

Nevertheless, a lot of work will be required in the next few years to include new functionalities and maintain the infrastructure. Preservation is a continuous task that never ends. As the audio recordings need to be continuously moved from one medium to another in order to preserve them, the software requires continuous updates to deal with obsolescence and the advent of new technologies. For example, artificial intelligence promises to deeply impact the oral history field. For this reason, the platform must be ready to include new features for restoring, analysing, retrieving, and reusing oral sources.

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