

The Many Uses of Digitized Oral History Collections: Implications for Design

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Abstract. Oral history - and spoken word collections generally - are assuming increasing importance in digital libraries as the storage, transmission and reproduction infrastructure improves. This paper describes three synergistic approaches to user needs analysis, explains how they are being applied to guide the design of systems to provide access oral history collections (using a subset of the Shoah Foundations collection of over 50,000 videotaped oral history interviews), presents preliminary results from so-called “discount requirements analysis” and an analysis of “early access” requests, and draws some design implications. The results show a wide variety of users and uses of oral history data and a concomitant variety of access points that would be useful

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Introduction

Spoken word collections fill a special place in the documentation of our cultural heritage, capturing aspects of the human experience that can be difficult to capture or convey as well in other formats. Dramatic improvements in the affordability of digital storage and the availability of adequate network bandwidth now make it practical to assemble enormous collections of digitized audio. This revolutionary change in physical access has not been matched by corresponding improvements in intellectual access, however – searching spoken word collections remains a time consuming and labor intensive task. In fact, relatively little is known how people will search and interact with digital spoken word collections. This paper reports some initial results from a series of studies that we are conducting to explore user needs in the context of access to oral histories, interviews with individuals in which they describe their recollections of events in their life. Our analysis of user needs is intended to guide the development of systems to provide access to a large collection of untranscribed videotaped oral histories in the MALACH project [Gustman, et al., 2002], but much of what we seek to learn has broader implications for other collections of oral history and for more generally for many types of spoken word collections.

When designing new access technologies we are often faced with a chicken-and-egg conundrum. The only way that we can know what we should build is to understand what the users of the system will need; but until we build such a system, there are no users with any experience that we can study! The only way out of this bind is to get some general idea of potential users and uses, build something, study the way it is used, and then iterate the process until the use is well enough understood to build what is actually needed. This is the approach that the Survivors of the Shoah Visual History Foundation has taken. Formed in 1994 by Steven Spielberg to capture the life stories of survivors and witnesses of the Holocaust, the Shoah Foundation conducted over 52,000 interviews in 67 countries, resulting in 116,000 hours of videotaped interviews. Over 10,000 of these interviews have been professionally cataloged, with access at the scale of complete interviews provided by the data from a 40-page Pre-Interview Questionnaire (PIQ) containing, among other data, names of people and places. Passage-level access to this collection is also possible, through thesaurus terms that have been manually associated with specific points in each interview by professional cataloguers. This is the first large collection of digitized oral history materials that we know of to provide such extensive direct support for passage-level access, so we have chosen to study its users, uses, and resulting requirements as a first step in our efforts to design system to provide effective intellectual access to oral history collections using this collection as a test bed. The results will inform our development of search techniques based on automatic speech processing, text classification, and cross-language information retrieval [Oard et al., 2002].

The remainder of this paper is organized as follows. In the next section, we describe three approaches that together will deepen our understanding of the needs of

users of oral history collections: discount requirements analysis, request analysis, and observation of use. Section 3 then reports preliminary results of our ongoing study, with emphasis on an analysis of 280 requests for access to the VHF collection. In Section 4, we draw some implications for the design of future systems to support access to digitized oral history collections. The paper concludes with some remarks about our plans for further work on user needs analysis and system development.

1 Methods

1.1 Discount requirements analysis

Full-fledged user requirements analysis involves interviewing users or potential users about their work - the tasks they work on, the problems they solve - and drawing inferences on what information would be helpful and the types of access required. This can be costly. Furthermore it assumes a circumscribed environment in which the potential users and uses of an information system are known. In an open environment, such as any system for public access, one must first identify potential users and uses and then study each group.

Discount requirements analysis relies on consulting experts, exploring the literature, talking to curators of oral history collections about what they want their collections used for, and informed intuition to gain insights into who the potential users are, the ways in which they might seek to use the collection, and the resulting access requirements that must be supported. This requires creativity and imagination, since experts, curators and potential users may not yet have experience with systems that perform the tasks that are envisioned.

We have found a sequenced strategy to be an effective approach to discount usability assessment. We first formed a reading group with diverse backgrounds (in this case, information studies, history, computer science, engineering, and geography) and chose a different aspect of the topic to explore each week. Some topics were related to the general nature of the materials (e.g., the treatment of oral history materials in intellectual property rights law), some were specific to anticipated uses of our collection (e.g., teaching the Holocaust in secondary schools), and some were specific to technologies that we expect to employ (e.g., automatic speech recognition). Once we had some familiarity with the topic, we began a series of discussions with curators of oral history collections. To date, these discussions have included the Survivors of the Shoah Visual History Foundation, the United States Holocaust Memorial Museum, the British Library's National Sound Archives, and Project Jukebox at the University of Alaska, Fairbanks. Recently, we have begun to augment these discussions with participation in meetings that bring together potential users of the collection that we are working with. To date, this has included a conference devoted to public history and a conference of scholars exploring the Holocaust as a case study for a community and individual reactions to traumatic life experiences.

Because discount requirements analysis relies more on opinion than on observation, it is better suited to hypothesis generation than to hypothesis testing. Nonetheless, it is possible to draw some firm conclusions, particularly with regard to the types of users and uses that might be anticipated. The most important contribution of discount usability assessment, however, has been to help shape the design of the request analysis process described in the next section, the user studies described in Section 5, and our understanding of the design space that we could productively explore.

1.2 Request analysis

Even though the Shoah Foundation collection is not yet open for public access, the foundation did respond to about 600 “early access” requests. While these requests do not constitute a representative sample of requests to be expected once public access is available, they can nevertheless provide some insights into a slice of requirements.

About half the requests were for specific interviews, leaving 280 to be analyzed. For these requests the data shown in Figure 1 were collected:

- Type of institution of the requester (e.g., museum, high school, TV studio)
- Discipline of the requester (e.g., history, education, film)
- General type of the end product /purpose of the request (e.g., dissertation, book, documentary, educational material)
- Topic of the request
- Discipline of the request (a film maker may have a historical question)
- Role the interviews found will play in producing the final product (data for analysis, illustrative quotes or segments to be shown, etc.)
- Types of access points needed for finding material for this request (e.g. person, place, specific camp, subject, age appropriateness)
- Specific access points needed.
For subjects: Thesaurus descriptor(s), subjects not in the thesaurus
- What pieces of information are particularly helpful in the answer (e.g., PIQ data, full interview, passages, passage summaries)

Fig. 1. Data collected in the analysis of requests

The materials available for each request consisted of a six-page Application for Early Access which asked for information on the requester, the requester’s institution, a working title, the proposed use of the archive, and information specific to the end product the requester wanted to create (for example, if the requestor specifies *exhibit* as the purpose, the application asks about target audience). An application is typically accompanied by other materials, such as the curriculum vitae of the requester, often an extensive description of the project, and correspondence. For many requests, these materials filled a hefty folder.

The data outlined in Figure 1 were collected on site by three of us over a three-week period, spending about 45 minutes analyzing a request. Data values for each field were selected from an open-ended list. Some data fields had a list of suggested values from the start; the system kept and displayed a list of all the values used so far in a field, and the students would select from this list or enter a new data value. Students also noted in the database suggestions for system design occasioned by analyzing this request.

For the preliminary data analysis, we manually organized the data values for each field into a meaningful hierarchy, resulting in an overall picture of users, uses, and potentially useful access points.

2.3 Observation of searching and information use

Discount requirements analysis and request analysis can together provide insight into the needs a broad range of users, but observations of user behavior are also needed if we are to gain insight into interaction strategies for systems that support effective information access and use. Hypothesis testing using quantitative user studies can be helpful at later stages in the design process, but qualitative study designs offer complementary strengths that are well suited to exploring a large design space. In further work, we plan to use case studies and focus groups, two widely used qualitative methods, to gain the insights we will need to develop the next iteration of our system design.

In our first study, we will observe three Holocaust scholars as they search the Shoah Foundation's collection. Because effective thesaurus-based searching requires an understanding of the design and content of the thesaurus, we will initially support this process using a trained human intermediary. The searchers will each interact with the thesaurus over a period of approximately two weeks, alternating between search and use of the materials, and we expect that over time they will become sufficiently familiar with the design of the system to allow us to also observe end-user search behavior without intermediation. We plan to focus this initial study on two aspects of searching behavior, formulation and reformulation of queries, and the process by which the relevance of retrieved passages in the interviews is judged. The study design also offers some opportunities to observe the way in which the retrieved passages are used in each scholar's research. [Belkin et al. 2001] [Kim et al. 2002] [Tang et al. 2001].

We plan to build on this initial study by assembling searchers with a broad range of information needs in a workshop setting. In addition to Holocaust scholars, we expect to invite primary and secondary school teachers, museum curators, and other potential users identified through discount requirements analysis. A workshop setting is well suited to a focus group design, in which we will provide some initial training, give each user a chance to work with the existing system to explore the collection, and then bring the group together to share their reactions. We expect the breadth of what we learn through this approach to complement the depth of the results from our first

study, together providing the insights that we will need to develop the next iteration of our system.

Sections 3 and 4, respectively, discuss the results from discount requirements analysis and request analysis and some implications for design.

2 Results

2.1 Users and uses

To maximize return on investment, an information system project must strive from the outset to identify as completely as feasible the users and uses that could and should be supported by the information system under construction. Through discount requirements analysis and request analysis, we identified a quite diverse group of actual and potential users and uses as shown in Figure 2. In the request analysis we determined both the discipline of the requester and the discipline of the request (a film maker may ask a historical request); the list below integrates the highly overlapping lists from both data fields and adds disciplines identified through discount requirements analysis.

arts, humanities, and social sciences	fine arts, art history
history, oral history	museum studies
biography and genealogy	performance arts
institutional history	(producer, director, writer, actor)
social sciences	film
sociology	theater
anthropology	audio production
communications	music
political science	education (teachers, students)
women's studies,	science
peace and conflict studies	health and medicine
Jewish studies	medicine
Holocaust studies	nursing
philosophy, ethics and theology	psychology
literature	law enforcement
comparative literature & cultural studies	community service
authoring (writer)	public information officer
linguistics	rights advocacy
publishing and journalism	human rights
non-material culture studies	social work
material culture studies	personal interest

Fig. 2. Disciplines of potential users and uses of oral history collections

As can be seen from this list, the use of oral history collections is by no means limited to historians. The spectrum of users and uses is astonishingly broad. The remainder of this section will discuss, by way of example, a few of these user groups

and the uses they make of oral history data. This discussion is based primarily on discount requirements analysis. Some observations on design directly related to specific uses are included here as well; design ideas are more systematically discussed in Section 4.

Historians prefer to find dates, whereabouts of events, or other standard information available from official records and other printed sources, but use oral histories to find out how people reacted to the events. Oral history interviews are a way to encourage people to reflect on their life, and then collect these reflections in a way that is not found in written sources, except perhaps diaries. Reactions to and the effects of events (from obvious ones like the Holocaust, to more obscure events such as changing jobs, marriage, or divorce) are not found in public documents. Besides the obvious convenience factor (that basic information is often found in easier accessed sources), the unreliability of memory is the reason historians generally give (as confirmed in conversations with noted academic historians) why they use oral history primarily for those personal reactions that cannot be documented elsewhere. This use requires (1) links between interviews and historical events and (2) the ability to search for interview passages that speak of the interviewees reactions through search terms like *feel*, *react*, *affect*, and *think* appearing in the responses of the interviewee or in the questions of the interviewer. (Reliable recognition of these terms is consequently a desirable capability for automatic speech recognition.)

While historians who utilize oral histories that they have not collected themselves often prefer to scan transcripts, they also want to listen to the original audio or video to be able to pick up on the intonations and emotions not shown in the transcript. Crying, laughing, stuttering and hesitating can all be clues that may support or belie spoken words.

Some research projects will focus on oral histories as a major source of data, such as in tracing the lives of one or more individuals, requiring the use of many interviews. Other projects will simply utilize oral histories briefly to illustrate a point or an event.

Linguists can use oral history interviews as rich use of studies on language use, dialects, and influence of one language on another. For example, the Holocaust survivor testimonies can be used to study the influence of Yiddish on other languages. [Gaertner 2002] This requires access by native language of the interviewee, language of the interviewer, dialect spoken in the interview, and the places where the interviewee resided over time.

Non-material culture studies is interested in all aspects of culture that are not material objects, such as customs and processes (the process of weaving, cooking etc.) [CIDOC 2002]. This requires access to passages that contain such information and contextual information that situates the custom or process described in space and time. Such passages might be identified by a list of indicator terms that would have to be developed empirically.

Education, whether done in schools, museums, youth groups, etc. and whether done through lectures, films, exhibits, discussion, or students interacting with a computer system, has the objective of helping students to acquire a body of knowledge and construct meaning in both the cognitive and the affective domain. This deliberately very broad statement has important consequences for design. We discuss here two uses of oral history data in education: (1) bringing history alive for

students and (2) driving home the importance of issues, such as tolerance. In both cases, oral history interviews, especially videotaped interviews, can provide vivid illustration on a concrete personal level and thus help students understand the role of historical events or understand abstract concepts (such as the importance of attitudes towards others).

One of the keys to successful education is to provide structure and context that helps the students building meaningful structures in their minds; in instructional materials, oral history data must be embedded in a larger context. This can be implemented through links between historical events or government policies and their implications for personal lives as documented in oral history interviews, or links between general principles of human conduct and specific instances where these principles are followed and where they are ignored. It can further be supported by a system gives students and teachers tools that allow them to weave together their own representation of historical events or of an issue from ideas and historical data found in the literature and a historical database (as available, for example, in the Perseus project, [Crane 1998]) and specific instances found in interviews.

To select interviews or passages, students and teachers need access by general access points of time and place, person, and subject (where access by abstract concepts is particularly important) and the education-specific access points of suitability for education (judged on factors such as vividly illustrating a point), age-appropriateness, and curriculum objective supported. Unfortunately, the access points most important for education are also among the most difficult to implement. One way of creating these access points is informed human judgment, which is expensive. It is an open research question whether an automatic classifier for these access points can be built..

Education shares with other areas the problem of interview-level versus passage-level access. Materials for students will not usually include entire interviews but are restricted to salient passages. Furthermore, it is doubtful that teachers have the time to scan entire interviews, so they need access to passages that are useful for education. All of this may require teachers helping teachers in creating an access system optimally useful for education (see Section 4).

Psychologists can use oral history interviews to study the effect of events on people. Trauma studies literature that focuses on survivors of the Shoah bring to light several access requirements for this specific group of users. Much of the literature seeks to discuss Shoah related trauma in terms of impact and consequence. For example, in research on the intergenerational transmission of Shoah trauma, researchers explore the impact of secrets, impact of sharing positive versus negative memories, and the impact of positive versus negative memories. (Bowen, 2001) Thus, this group of users is interested not only in the stories explicitly articulated but also the stories' tacit manifestations in other experiences throughout a survivor's life.

Trauma studies researchers also need the ability to correlate the interviews with contextual information surrounding the survivors' stories. For example, impact of the Shoah experience is also said to vary among survivors depending on the age at which the experience began and its duration. For example, where a Polish child aged ten in 1939 had to survive six years to liberation, a Hungarian child of the same age experienced an additional five years in relative safety. While both children were 16 at

the time of liberation, the Hungarian child had attended school until the age of 15 whereas the Polish child had received no education since 1939. (Krell, 1993)

Further, trauma researchers are interested in tracing the impact of traumatic experiences through a person's life. Some literature discusses latency in the emergence of symptoms related to the impact of severe trauma. For example, for many post-liberation was a period of searching for loved ones, emigration, finding work, learning new languages, etc. These occupations often delayed the onset of symptoms related to their traumatic experience. For the child survivor specifically, post-liberation may have been a period of extended trauma as hope of reuniting with family was extinguished. As a result, the literature suggests that some child survivors actually experience their first effects related to trauma at the adult age of 45 to 55. In response to this issue, some research is being conducted to link the triggers of traumatic memories to current life situations. (Krell, 1993) These researchers need to access entire testimonies with the ability of linking early and late passages.

Psychologists often record their own interviews using their own interviewing methods and are concerned about using interviews recorded under circumstances beyond their control. What would help them ascertain the suitability of an interview for their purposes is a transcript of the questions asked, whether or not a transcript of the full interview is available. This suggests a more generally useful tool as discussed below.

Observation in common to several areas.

For many purposes it would be useful to have list of the interviewer questions as a kind of map of the interview. If transcripts are available, this is easy to construct. If transcripts are not available, automatic speech processing, through detecting speaker turns, could extract the questions for human transcription (which would be a lot cheaper than transcribing the entire interview. Even if interviewers' speech is clearer than interviewee speech, producing a readable transcript of questions through automated speech recognition may not be possible for some time if ever.

Some users need to read entire interviews, others just need relevant passages. However, a passage out of context can be misunderstood, so the interface must allow the user to quickly get a sense of the context of the passage she is looking at.

2.2 Topics and end products

The list of topics shown in Figure 3 gives a flavor of the requests received by the Shoah Foundation. The topics were taken from the title given in the application where it was available and meaningful and otherwise assigned by the person analyzing the request. About 2/3 of the requests are for specific place and persons while the remaining 1/3 are for abstract concepts. This ratio varies by discipline; genealogy requests will almost exclusively focus on persons and secondarily places while psychology requests will focus primarily on subject. Retrieval for abstract concepts requires human indexing, automatic assignment through a classifier based on training data, or indicator words specified by the searcher or learned from training data.

Differences in the narrative of memories of bilingual Holocaust survivors when told in a second language, compared to the mother tongue

Losing religious faith as a result of Holocaust experience

Motivational strengths that sustained survivors through the Holocaust

Prague: Jewish underground and its influence on post-war Czechoslovakia

Uncommon Decency: Hidden Children and Rescuers During World War II

Wartime and post wartime theft of Jewish property

Survivors of the Nazi eugenics policies

Similarities between the Holocaust and the Rwandan genocide

The liberation of Buchenwald and Dachau concentration camps

Music in the Holocaust

Warsaw ghetto

Reception of WWII victims in the Netherlands

Lithuanian Jewish survivors

Holocaust survivors, witnesses, and liberators in western North Carolina

Prisoners from French-speaking countries in the Dachau camp and subcamps

Impact of Raoul Wallenberg and Adolf Eichmann on humanity

Sarah Ehrenhalt-Israel's life

Fig. 3. Topics of Shoah Foundation requests. Some examples

Figure 4 gives a list of the end products that users want to create with the aid of the information obtained from the Shoah Foundation archive. Again, there is a wide variety.

<p>literary work</p> <ul style="list-style-type: none"> monograph novel play screenplay biography obituary children's book article brochure storyboard <p>public presentation</p> <ul style="list-style-type: none"> radio program television program edited reel documentary film video CDROM 	<p>research project, paper, thesis</p> <p>educational resource</p> <ul style="list-style-type: none"> school curricula course seminar classroom lecture training material teachers guide study kit camp program exhibit <p>evidence for legal proceeding (criminal charges, class action lawsuit)</p> <p>tool in psychoanalytic counseling</p> <p>personal use</p>
<p>Fig. 4. Products created with the aid of Shoah Foundation oral history data</p>	

2.3 Access points needed

The analysis of the requests showed the *types of access points* that would be useful in answering requests put to the system (Figure 5). Most of these are already in the Shoah Foundation's system. Just as importantly, the analysis identified a number of *specific descriptors* that would be helpful in searching but are not presently included in the Shoah Foundation thesaurus (for most requests appropriate descriptors were available). Figure 6 gives some examples of descriptor suggestions to illustrate the usefulness of request analysis for thesaurus updating. While these descriptors would be useful in answering requests and are therefore desirable (request-oriented indexing, [Soergel 1985]), some of them would require considerable subject expertise for correct and reliable assignments or may not be in the scope of the organizations mission and may therefore not be suitable for inclusion in the thesaurus. On the other hand, they could be assigned by subject expert users through collaborative indexing (see Section 4).

person
 organization
 place
 type of place (e.g., camp, ghetto)
 time, time period
 event
 subject
 testimony characteristics
 language
 contains still images (by subject of image)
 exceptional content (e.g., vivid/powerful, moving/emotional)
 age appropriateness

Fig. 5. Types of access points needed

quality of life	torture
post-liberation reception in home country	Jewish law
indifference	forced labor: corpse delivery/removal
absence of hatred	counterfeiting
guilt	film
intergenerational transmission of trauma	singing
loss of structured chronology	music in the ghettos
sense of artificiality	prisoner orchestras
psychological reactions to perpetrators	metaphor
psychological healing	camp publication
tolerance	characteristics of survivors
heroism	disabled survivor
courage	disability
refusal to be cowed by authority	camp nurses
revenge	African-American liberators

Fig. 6. Descriptor suggestions identified through request analysis

2.4 Types of information helpful to the requester and role of information

Figure 7 lists the types of information that might be included in the answer. The request analysts made a judgments which of these types of information would be

helpful to the requester either based on explicit notes in the application or base on an analysis of what might serve the requester's purpose.

- pre-interview questionnaire data (PIQ, interview metadata)**
 - interview information
 - PIQ-Survivor Information
 - PIQ-prewar life
 - PIQ-wartime
 - PIQ-postwar
- the interview itself**
 - whole interview
 - interview passage
- summary**
 - whole interview summary
 - passage summary
- form of presentation of the interview**
 - audio and video
 - audio only
 - transcript
- information that could be derived form or linked to from interview or PIQ**
 - images
 - timeline of events covered in the interview
 - map

Fig. 7. Type of information helpful to the requester

Figure 8 lists the role these materials will play in the final product as identified from the application or the analysts judgment. These categories need to be further refined but will be important for system design. Examples of *data for analysis* would be the use of assigned descriptors and original country of origin of the interviewee to see whether the topics discussed differ from country to country or the use of speech recognition data together with emotion detection data (assuming these could be generated) to derive correlations between topics discussed in the interviews and the emotions displayed by the interviewee

elements of interview to appear in end product

video footage
audio clips
illustrative quotes

data in testimonies or PIQs to provide primary basis for end product

data for analysis
eyewitness accounts as primary basis for a history

data in testimonies or PIQs to provide secondary support for end product

source of specific supplemental information
checking historical accuracy

Fig. 8. Role of information in end product

3 Design implications

The requirements analysis resulted in many design ideas; this section discusses three of them.

Both discount requirements analysis and the notes on design features collected during the request analysis identified the requirement of **embedding oral history interviews in a context** (see Section 3.1, History and Education). This can take many forms:

Links from persons, places, and events mentioned in an interview to information about people, places, and events. For example, the user could follow a link from an interview that talks about life in a given city to images of that city or to events that happened in or near that city around the time of the story told in the interview. (In an advanced system of this sort, the user could even take a virtual walk through the city.) Or the user could follow a link from a person to a picture of that person. Or the user could follow a link from a personal story told in an interview to the government policy that caused that story to happen (or conversely follow a link from a government policy to instances of how it affected people's lives). With sufficient resources, one could build a very rich environment for users to explore. (For an example see [Crane 1998].)

Interview-level or passage level links to other documents, such as books, articles, documentaries, lessons. This collection of links could be started with links to documents produced by users of the collection by linking a document to the interviews or interview passages used in its creation. Additional links could be entered by users as discussed below.

In a museum: Links to museum objects discussed in an interview.

In the archives of an organization: Links to written records that are related to the subject matter discussed in the interview. This might help a user to better understand the circumstances under which certain records were created or to

capture the atmosphere in the organization at the time the records were created and thus provide a better basis for the interpretation of the records.

Discount requirements analysis showed the importance of **navigating within an interview** and both approaches to requirements analysis showed the **importance of access by person and place**. A possible design to achieve these goals combines interview-level metadata with navigation. One type of metadata record lists all persons and places in an interview (it is somewhat analogous to an archival finding aid); the Shoah Foundation collection includes for each interview a pre-interview questionnaire that contains, among other things, names of persons and places. Another type of metadata record consists of a list of the interviewer's questions (this could be seen as the special case of a hierarchically structured map of the interview). The navigation idea can be stated very simply: Select an element in the metadata record (for example by clicking on it) to jump to the right place in the interview. For example, a user could search the whole collection for a name, look at a metadata record found, find the name in the metadata record, click on it and jump to the first places in the interview where that name is mentioned, *next* would jump to the next occurrence of the name, etc. Conversely, it should be possible to listen to an interview, click when a name is mentioned, and jump to that name in the metadata record, thus getting more information about the person (or place) and gaining access to the other places in the interview where it is mentioned. In the absence of human-produced transcripts, implementing this simple idea for personal names or place names is far from trivial: proper names are difficult to recognize in automatic speech recognition systems (and even people have difficulty spelling names correctly); furthermore, a person or place may be referred to by any of many name variants (given name, nick name, name in different languages, including, in the Shoah Foundation collection, Hebrew and Yiddish). For place names, an added problem are the changes over time, particularly as political boundaries change. Creating an "interviewer question map" is also non-trivial as discussed in Section 3.1.

Both approaches to requirements analysis identified types of access points that are important for all or some user communities but that would be difficult to produce by either human cataloging (for reasons of both expertise required and cost) or automated cataloging based on automated speech recognition results. This motivates the desirability of a **user-enhanced catalog**, or collaborative indexing/cataloging [Semple et al 2000]. Users often examine the interviews very carefully from their own perspective. One teacher's selections of passages useful in a lesson on the bad effects of *name calling* (calling class mates or others derogatory names) will most likely be useful for another teacher preparing a lesson on the same subject; having the results of the first teacher available can save the second teacher a lot of work. A system that supports communities of users in sharing the results of their analysis would be very useful. Contributions from user communities could be stored as adjuncts to the master catalog produced by the organization holding the collection. The user could then choose which of these adjuncts she wants to use, and the system would consider these in searching and display (possibly marking the user contributions in some way to preserve the integrity of the master catalog).

Observation of design issues during request analysis identified that it would be useful to **allow retrieval of interview passages that deal with movement from place to place**. One approach to addressing this problem would be to build an automated classifier that can categorize such passages; among the indicator words for such a classifier one would likely find *from, to, travel, walk, hike, train*. This in turn identifies as a desirable capability for automated speech recognition that such words be recognized reliably.

4 Further work

We will perform a detailed analysis of the request data. In particular, we will analyze requirements as a function of discipline and type of end product. That will provide a basis for designing a system that can adapt its interfaces to the request at hand once the discipline of the requester and the purpose of the request are known.

We plan to continue our discount requirements analysis, consulting more literature sources and experts. We also plan to extend the request analysis to other oral history collections. The extension of our studies to include observations of searching and information use and focus groups of users are described in Section 2.3

Finally, we will explore the design ideas that emerged from the requirements analysis and incorporate them into experimental systems as feasible. The MALACH Web site [Gustman et al. 200] will contain updates on our work.

5 Conclusions

The first step in any requirements analysis process is to identify the potential users and their needs. We have found that a combination of discount requirements analysis and an initial analysis of 280 requests for advanced access to the Shoah Foundation's collection together did yield valuable insights into user needs. In the MALACH project, these insights will help to shape our work as we refine the design of our systems and begin to incorporate new capabilities such as indexing based on automatic speech recognition. As we learn more, we hope to begin to generalize from our specific experience in ways that will benefit others who seek to provide access to oral history collections, and to spoken word collections more generally. Far more is spoken each day than is written, so effective access to vast collections of spoken recollections could have a profound impact on the ability of our many communities to learn from their past, thus empowering them to better shape their own future.

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