Thick interfaces: Mobilizing language documentation with multimedia

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Introduction

This chapter assumes that you hope that some of your fieldwork results will one day be applied to the maintenance, strengthening, or revitalization of the visited community's language. The documentation approach (Himmelmann 1998; Woodbury 2003) outlines fieldwork methodologies that increase the possibility that results can be used for these purposes. In addition, funding agencies such as HRELP insist that project results are "accessible to and usable by members of the language community as well as the wider linguistic community" (HRELP 2005).

It is also wise to plan what kind of language support might be possible and to have an idea in advance of what works best. There are many ways that fieldwork results can be applied to improving local language situations – for example, by providing teaching notes, grammatical explanations, and dictionaries, and running workshops (cf. von Gleich 2005; and Chapter 3) – but this chapter focuses on creating *multimedia products*, because

- they allow sound/video[1] to be presented and controlled;
- they integrate sound with other information;
- in many cases, they can be directly derived from rich fieldwork datasets;
- language teachers typically need accessible, interesting, and flexible language resources rather than analytical or even pedagogical resources, because teaching and learning situations vary.

Further reasons why multimedia is particularly effective in endangered languages situations will be mentioned below.

1. Mobilization

To introduce the potential uses of multimedia, this chapter discusses the *mobilization* of language documentation. Mobilization means taking lin-

guistic documentation and working with speaker communities and other specialists to deliver products that can be used to counter language endangerment.

1.1. Purpose and scope

The term *mobilization* was recently introduced to point out that standardization of data and metadata formats should not exhaust the contribution that information technology can make to endangered languages data (Nathan 2003).[2] IT's use in documentation is normally constrained to entering, managing and browsing data, building catalogues, and digital archiving. These functions are important for working with data, and preserving and providing access to it, but they offer limited benefit for many audiences, in particular, for language communities. Recording and computer technologies allow us to create high-quality "born digital" documentation materials; but without suitable methods to effectively deliver these materials, they are also *born archival*, leaping directly from the last speakers to the preservation vault.

This chapter presents mobilization in terms of two complementary types of interfaces – the channels of communication and interaction between researchers and community, and the computer screen displays through which people interact with language resources.

A key aspect of mobilization is that it is best done, like fieldwork, in full collaboration with language communities. This is because to deliver resources that support speakers and learners, you need to know about their aims, priorities, resources, and local technological infrastructure. In addition, many of the ingredients of multimedia, such as art and design, will provide the cultural flavor of the product, and therefore should also be created or selected in collaboration and consultation with community members.

Mobilization is part of a framework for "fieldwork *delivered to* a language community," one of a set of fieldwork frameworks that resulted from successive changes in political and ethical outlook over the 20th century:

- fieldwork *on* a language;
- fieldwork *for* the language community;
- fieldwork *with/by* speakers of the language community;
- fieldwork *delivered to* a language community.

The first three frameworks are formulated in Grinevald (2003: 58).[3] Fieldwork *on* a language is the classic academic investigation involving a linguist and his/her "informant". In fieldwork *for* a language, communities began to exert some control over research, and linguists became "useful" to communities, typically in the sense of advocacy (rather than, say, tailoring their outputs to community needs). Then, from the 1980s, communities increasingly became collaborators in research, and, with more contexts for community control, and better local training, fieldwork is carried out *with* and *by* community members.

By contrast, the "deliver *to*" framework is concerned with timely provision of effective language resources in order to encourage and support language strengthening. It emphasizes product delivery and language outcomes over the nature of the fieldwork process or distinguishing between the roles played by community members or linguists. Typically, a fieldwork-based project will involve a mix of all of these framework activities; however, one that delivers usable resources based on documentations can be said to provide mobilization.

We turn now to the other type of interface; the computer screen displays through which people interact with language resources, first considering where information technology and, more specifically, multimedia, fit into the documentation agenda, then looking at some specific examples.

1.2. Where does information technology fit in?

Information technology plays a central role in language documentation. For example, it heads Woodbury's (2003: 36) lists of elements that "set the stage for [the] reconceptualization" of documentation:

> we should be able to link transcriptions with audio- and videotapes, and entries and dictionaries or statements in grammars with large databases of illustrative examples. (Woodbury 2003: 36)[4]

In addition, computer users, including increasing numbers of speakers of endangered languages, now have skills and experience in using many computer-based genres such as games, interactive encyclopedias, media editing applications, word processors, web browsers, and search engines (Nathan 2000a: 46; Grinevald 2005). Taking all of these together with the ongoing convergence of electronic archives, libraries, and publishing, these users have ever greater expectations of linguistic resources.

From the other direction, information technologists are paying more and more attention to language and communication. Today, a range of technology types are applied to languages, each providing increasing levels of linguistic interaction:

I	II	III
resource discovery: supporting access	*mobilization*: creating usable resources	*telecommunications*: providing open channels

Development of resource discovery [I] is well under way (e.g. OLAC nd). Mobilization [II], like resource discovery, relies on the creation of linguistic materials, but, in common with telecommunications, involves relationships between producers and receivers. Although telecommunications (telephony, video links, and real time voice recognition, transcription and translation) offers considerable potential for language documentation, it is rarely used.

2. Multimedia

In this section, we look at the properties of multimedia and look further at why it is suited to supporting endangered languages. Normal human participation in linguistic events generally involves listening, seeing, and other modalities. However, languages have long been represented (and documented) using only text, or, more recently, sound. We have been restricted to *monomedia* because we have been limited by the available technologies – writing, printing, and magnetic tape. Thus, although the name *multimedia* implies complexity, it actually expresses the overcoming of previous constraints.[5] Today's multimedia technologies allow more authentic modes of expression. They can be defined as combinations of audio, video, images, and text, integrated and coordinated by a computer to allow user control and interaction.

There are several specific reasons to consider delivering multimedia as one of the outcomes of language documentation. Firstly, it sets up productive linkages between the *process* and the *outcomes* of fieldwork. Creating multimedia requires consideration of its effectiveness and its audience, and thus the language community takes the role of clients whose wider linguistic needs must be understood and from whom feedback must regularly be sought. Multimedia products must be planned early in the fieldwork process,

so that suitable recordings can be made and other material collected; later, prototypes must be tested with the target audiences (although multimedia can be based on pre-existing recordings, recordings created in the context of a project with community participation will typically produce better results; Nathan 2004: 157). Therefore, multimedia products cannot be created by working in isolation, far from the community and separated from fieldwork and data collection. A clear, negotiated plan for creating a locally usable multimedia product is likely to provide the motivation and contexts for community interest and participation in all aspects of the fieldwork. It will also be the first step in creating a community "biography" of the product, which in turn will increase their enthusiasm for *using* it when it is delivered.

Secondly, using multimedia changes the way that community members and their language are represented. Multimedia products directly present a community member's relationships to the language and linguistic events, because their audio or video performances are not shifted to written forms or mediated by analysis. As a result, participants are actors rather than consultants, and they address the product's users directly, rather than through the information interpreted by a researcher.

Bird (1999a) noted that linking an analysis to the original recordings on which it is based can provide a more scientific linguistic account, because any user can examine the analysis in the light of the actual "data". For language community members, the advantages of providing ready access to rich and contextualized representations of actually occurring language events are even greater. Users can recognize individuals and experience language content in the context of real situations and relationships. In fact, multimedia can provide many connections – social, emotional, intellectual, and learning – between the user of the product and the represented actors and linguistic events.

Developing multimedia involves activities consistent with the desiderata for language documentation. It directs attention to the nature of linguistic events and performances in their social and physical contexts. When preparing the content for a multimedia product (Nathan 2004) one needs to take into account factors such as the variety, coverage, and quality of recordings of events; factors that echo the priorities of documentary linguistics (Himmelmann 1998). Multimedia typically requires a multi-skilled team and therefore reminds us of the multidisciplinary nature of documentation; it potentially exposes linguists to the expertise of designers, teachers, and programmers, and results in multimodal products that can be used in

different disciplines. Even existing "legacy" materials can be given new life by using them as assets in a multimedia product.

For more discussion about practical benefits that accrue from multimedia project work, see Csató and Nathan (2004).

3. Thin interfaces

Multimedia products might be distinguished by the presence of sound or video, but the presence of sound or video is not enough to qualify a product as multimedia. The criteria that we use to judge the quality or effectiveness of a multimedia product are yet more demanding.

First, consider a product that consists simply of primary recordings, together with their metadata.[6] According to the definition offered in the previous section, such a product would not qualify as multimedia: the recordings and the metadata are not combined in a way to allow user interaction. In fact, a standard music CD is just such a product, with the metadata printed on the cover and the audio playable from the disk.

Second, consider a product that allows you to view your primary data, as well as to add various layers of labelling, analysis, etc. to it. This would be more likely to qualify as multimedia, since it exploits the unique abilities of computers to allow us to control and manipulate data. Such products are typically software applications dedicated to inputting and managing data; an example well known to many linguists is SIL's "Shoebox" software for creating lexica and entering and glossing sentences (see Figure 1 below). Shoebox does not support sound or video, so to add annotations to sound and video, many linguists turn to software such as ELAN and Transcriber (see the reference list at the end of this volume).

However, none of these examples of software can really be regarded as ends in themselves. They are *tools* to assist in creating usable products that deliver content, just as a word processor or layout software is used to create a book. They are characterized by instrumental, limited-purpose interfaces that are transparent projections of their underlying data (Cooper 1995: 31), and that are used to construct and browse that data. Our second category, then – tools for working with data – can be thought of as "thin interfaces" because:

– they do not obscure or reorganize the details of the data – they are used to transparently view and manage such details;

– they do not add capabilities beyond those that are required to view and manage the data;
– they emphasize the acquisition of content, not its presentation or exploration;
– they are used effectively only by domain specialists.

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Figure 1. Sample Shoebox data (Akan Encyclopaedic Dictionary Project)[7]

4. Documentation and thick interfaces

Thin interfaces emphasize the management of data; however, we have defined mobilization as concerned with rich, flexible resources with the capability to support language strengthening and learning. For mobilization, we have to employ "thick interfaces" – creatively-designed and readily-usable software.

Thick interfaces draw not only on linguistic documentations but on the fields of graphic design, computer-usability, and, perhaps, instructional design. There are currently no settled conventions or standards for such products; the pursuit of thick interfaces challenges us to create new genres for expressing language documentation. A survey of the practice of interface design is beyond the scope of this chapter,[7] but key factors to be considered include user-group needs, choice of genre, and effective usages of hypertext and multimedia. Good thick interfaces can be explored in different ways to perform a variety of tasks. They:

- clearly reflect the collaboration and contribution of the community participants;
- use idioms to allow users to accomplish complex tasks;
- provide culturally appropriate and rational designs for presenting and navigating among content;
- allow users to make their own valid interpretations.

Cooper (1995), echoing our distinction here between thin and thick interfaces, urges that interfaces should not be determined by their underlying data, but by the needs of users and in terms of users' understanding of the represented domain. Thus multimedia mobilization entails researching and designing innovative interfaces, not only because there are no existing conventions, but also because each language, community, and set of users is different.

Design strategies, according to Cooper, should move away from data models (which recapitulate the underlying data), to metaphors (which are better, but limited by the metaphor chosen), or, preferably, to idioms that use "gizmos". Gizmos are virtual objects manipulated by users in order to perform functions of arbitrary complexity. Their idiomatic behavior must be learned, but once learned, they optimally support the performance of a task (an example is the scrollbar, where you drag a block down to move a page up). Well-designed idiomatic interfaces support learning; contemporary constructivist approaches to learning argue "that learning occurs best as a result of doing, creating, and building … [through] the manipulation of real or virtual objects" (Goldman-Segal 1994: 258).

In the following sections, several multimedia products are briefly described, in order to illustrate how aspects of their interfaces support the aims of mobilization. As the examples show, thick interfaces reflect the contexts in which they are developed; the cultures, project participants, and development processes. There is no template or cookie-cutter approach that can do them justice.

4.1. Collaborative interfaces

The first two examples are based on *Paakantyi* (Hercus and Nathan 2002), a CD-ROM developed to help support school-based language revitalization efforts in Wilcannia, Wentworth, and other towns in the Paakantyi country of southwestern New South Wales, Australia.[8] This section presents a short

case study illustrating the emergence of an interface as a result of a collaborative process involving the linguist, multimedia developer, and Paakantyi community members.

At every stage of the project we prepared and delivered product drafts representing the ongoing state of the CD in order to:

– make it easier for people to give feedback about concrete products rather than react to abstractions;
– demonstrate our ongoing commitment to the project;
– help create a community "story" or "biography" for the CD.

We also workshopped some project participants in techniques for recording, digitizing, editing, and linking the sounds they contributed.

Key graphic and navigational systems of the CD resulted from this collaborative work on its design and its linguistic and graphic content. Initially, we were given permissions to use several artworks to decorate the CD (the Paakantyi community boasts several accomplished artists). Under the guidance of Badger Bates – a Paakantyi speaker, Park Ranger, and nationally-recognized artist and sculptor – the design evolved so that recordings of important speakers from previous generations of speakers became systematically accessed via artwork created by their respective living descendants. This, we believe, contributed to the aesthetic balance of the CD, which ultimately gained keen acceptance within the community. The navigational structures are summarized in Figure 2. The top row lists the "old time" speakers from previous generations whose texts and songs feature on the CD. These people have all passed away some time ago. The oval disks in the middle row correspond to main resources in the CD – two stories (Mutawintyi, Anteater), songs (including Emu), and the talking dictionary. The bottom row lists project participants who contributed art (the two left boxes) and linguistic content (the two right boxes, with Badger Bates contributing both). The arrows represent linguistic input; the other bullet-head lines represent the provision of artwork. Vertical alignment indicates ancestry (both Dumbo Dutton and the Bates family descend from 'Gunsmoke' Johnson).

The example shows how an interface design "emerged" as a result of collaboration, to result in a design that was not only more aesthetically attractive, but also actually communicated more information – information about the genealogical relationships between past and present participants – even though this information may not be apparent to non-community members.

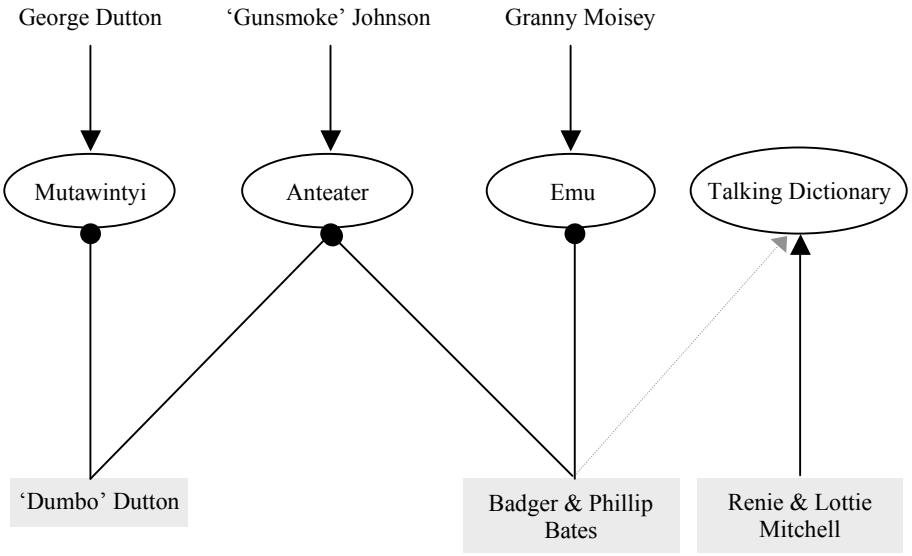

Figure 2. Participants, art and language in the Paakantyi CD (Hercus and Nathan 2002)

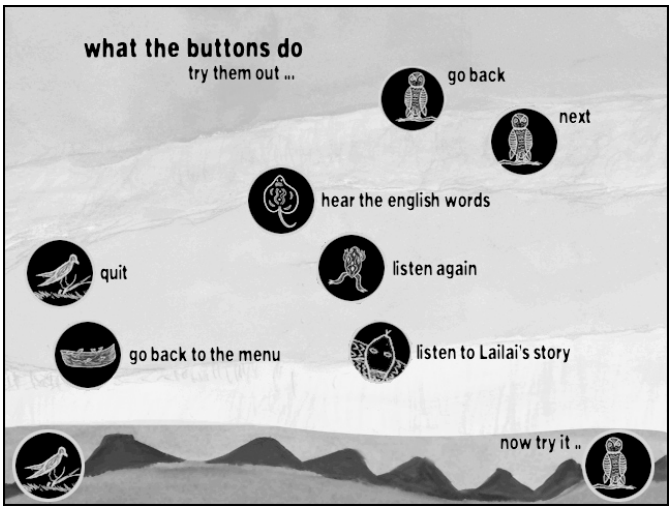

Figure 3. Environmental objects as controls in Bunuba Yarrangi Thanani (KLRC nd)

4.2. Appropriate interfaces

Interfaces should help users perform their tasks while respecting local cultural and aesthetic styles. But they should *not* be based on stylized impressions of a culture.[9] Some earlier productions confused the two aims by, for example, using rocks, animals and other environmental objects as buttons and menus, as shown in Figure 3. These objects do not function well as navigational metaphors because the animals displayed are unlikely to be associated with buttons or navigation. Instead, they require memorization and draw the user's attention to the interface itself rather than support the navigational task.

By contrast, the *Paakantyi* CD (see previous section, and Figure 4 below) uses a mainly text-driven interface created by a graphic designer who was given a brief to create a crisp, contemporary feel. It has been very well received and found easy to use; Paakantyi students transcend their everyday literacy levels in using it, because it allows them to focus on their chosen tasks, most especially to navigate to spoken entries in the CD's talking dictionary (cf. Goodall and Flick [1996], who urge avoidance of text elements in interfaces for Aboriginal children).[10]

Although the *Paakantyi* interface largely utilizes text, it is not a "thin" interface. Displayed text is not a simple projection of the underlying data, which is considerably more complex and incorporates thousands of links between various text and sound objects. Furthermore, much of the text functions not as content but as navigation controls that users can click on. Notice also that in Figure 4 there are variant spellings; these are the result of differences between Hercus' original research in the 1960s and the new data we recorded in 2000. The CD simply presents both variants and allows the users to draw their own conclusions.

With regard to this example, it may be worth noting that text-based interfaces can work well even in societies that do not have traditions of literacy in their own languages. Many such people do have literacies, of course, in other dominant languages (such as English in this case; it may be Arabic, Chinese, Russian, or other languages elsewhere). In addition, there is not just a single type of literacy. Other literacies, such as computer literacies, have quickly developed over the last decade across much of the world, especially as a result of familiarity with software used for internet access, and these literacies involve changes in the functional balance between text, layout, and graphics in comparison to standard "book" literacy (Nathan 2000a). At the limit, we can say that consistent text-based screen navigation

objects can function like icons, and also that simply using images for navigation does not, by itself, ensure a usable interface.

Figure 4. Navigating in the Paakantyi talking dictionary (Hercus and Nathan 2002)

4.3. Idiomatic interfaces

The *Spoken Karaim* CD-ROM (Csató and Nathan 2003b)[11] was developed as a multimedia documentation of the language, culture, and environment of the Karaim community of Trakai, Lithuania. It is centered on several narrative monologues spoken by the last full speakers of the language; these are all transcribed, morphologically annotated, and linked to a rich lexicon, grammar, and concordance; in addition, the linguistic material is accompanied by songs, videos, photographs, and eight thematic articles on Karaim history, religion, etc.

The CD also contains a system we call "Active morphology" that generates inflected nouns using an inbuilt full computational model of Karaim morphophonology (Nathan 2000b). Inflection is represented by the idiom of dragging objects onto headwords. The system is presented to the user as a set of small moveable blocks that, when dragged onto a dictionary headword, initiate the generation and display of the appropriate inflected form (see Figures 5 and 6). By keeping terminology basic, the morphophono-

logical rules unseen, and its operation as simple as possible, the system is backgrounded for most users, and may, paradoxically, even remain undiscovered. However, given a rational context for use, it is easy to learn how to use.

The effectiveness of this system was confirmed during the recent Karaim Summer School in 2004. We developed interactive, computer-generated multimedia crossword games as language teaching aids (there were three types: normal crosswords, talking crosswords, and picture crosswords). The Karaim students were encouraged to use *Spoken Karaim* to look up words they didn't know. Their responses illustrated the three factors of *idiom*, *rational design*, and *open interpretation* mentioned in the introduction to this section. Motivated by competitive crossword games, and faced with clues whose answers required inflected forms, students found and used for the first time the idiomatic *Active morphology* controls, and they explored the CD in new ways, including its interactive concordance (which finds inflected roots within narratives). In performing these activities, the students explored the CD's language content and selected and interpreted the results in order to complete the crosswords.

4.4. "Dangerous" interfaces

A community's knowledge and modes of presentation can go even further in defining a product's interface and usage. Barbara Glowczewski's *Dream Trackers: Yapa Art and Knowledge of the Australian Desert* (2001a) is a comprehensive CD presenting the land, language, and culture of the Warlpiri (also known as Yapa) people of the Northern Territory, Australia. Its interface is structured by Warlpiri forms of knowledge representation, which highlight networks of associations. It opens with an interactive map of "dreaming paths" in an extraordinarily complex, criss-crossing pattern. Nodes on these paths are interlinked with various stories, text, and artwork throughout the CD. Glowczewski (2001b: 142) wanted the links "to follow rules and to have meanings that respected the connections that the Warlpiri themselves establish according to their own cognitive logic."

> The visual transposition of this Aboriginal cognitive mapping into an interactive map gives the user an immediate experience of this inter-connectivity … Multimedia is an ideal tool for rendering this Indigenous mapping. This invitation to wander in the territory of the Dreaming story-telling, painting, singing and dancing made the old persons extremely happy when they saw

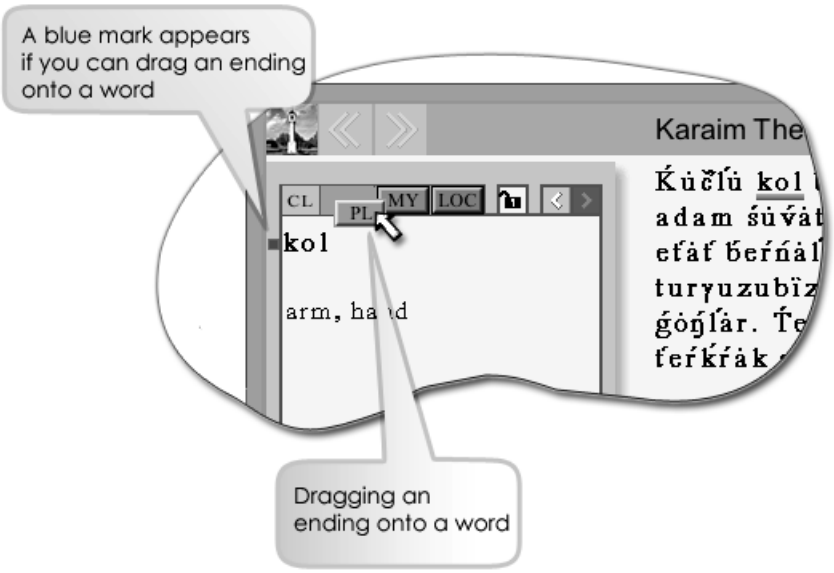

Figure 5. Operation of Spoken Karaim's "Active morphology" (extract from the CD's Help file)

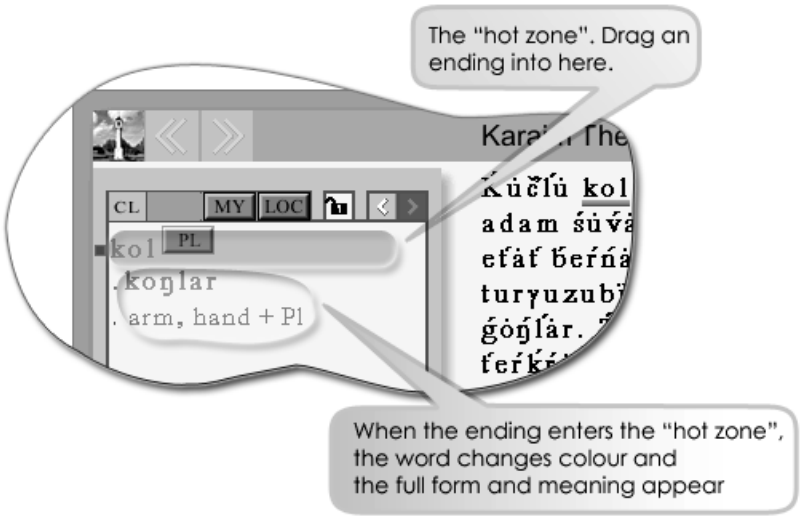

Figure 6. Result of "Active morphology" operation

> tangible proof of their teaching about the inter-relatedness of the Dreaming. The elders and all the women I worked with were excited by the new medium because it did not threaten their encyclopaedic knowledge or their power in the society. On the contrary, their legitimacy was affirmed by the fact that they are recognized by name as story-tellers and painters.
>
> (Glowczewski 2001b: 146)

However, some Warlpiri people were also deeply disturbed by the CD, because they saw that, for the first time, something fundamental about their knowledge was revealed to outsiders. Ultimately, this led to the community restricting the distribution of the CD (Glowczewski 2001b: 150). This restriction, paradoxically, was a measure of the *success* of the mobilization in Warlpiri terms. Warlpiri people took responsibility for control over it in the same way that they generally seek to be custodians over their culture and knowledge.

5. Conclusion: challenges for multimedia

This chapter has presented motivations for and examples of using multimedia and "thick interfaces" to mobilize language documentation in support of endangered languages. We could summarize factors in creating such a product as a set of heuristics all of which are essential for a "good" mobilization:

- it supports exploration;
- its functions go beyond the underlying data;
- it manifests community input and participation;
- it fully exploits the capability to present and control sound;
- users can interact with content in relevant (and innovative) ways;
- it has design integrity.

Obviously, developing custom, high-quality multimedia applications to support endangered languages can consume considerable resources and require solid dedication (see Nathan 2004 for more information about planning such a project). In fact, such projects have occasionally been described as a waste of scarce resources (e.g. Simpson 2003). However, if it is true that developing multimedia can offer a distinct contribution in endangered language situations then to call it a "waste" is to place community needs as a low priority.

Another challenge comes from an increasing preference for open source software and open data formats.[12] While most current fully-featured multimedia authoring and presentation tools are proprietary products with closed data formats,[13] the effort expended in developing content far exceeds the cost of even the most expensive of them. Without these well-developed authoring tools, the development of applications for a community would consume more, not less, resources.[14] Again, decisions have to be made on the basis of priorities for providing particular kinds of products and language support.

Multimedia is a new and complex technology and choosing to use it for mobilization will also involve making trade-offs between its positive contributions to language communities and its less-than-optimal suitability for archiving, repurposing, and even distribution. Many multimedia resources are not readily archived and have limited longevity. These limitations can be due to closed formats, but are, more broadly, an inevitable result of deciding to develop multimedia rather than other types of resources. Multimedia involves integrating a variety of media and file formats, and the use of *any* digital media in language documentation is vulnerable to the instability of a variety of formats, even open-standard ones. In addition, there are no settled conventions for designing and describing interfaces, and it is not fully known how to neutrally represent and archive abstract content such as navigation, layout, links, and interactivity. These various challenges mean that one works with multimedia not as a general strategy for satisfying diverse needs such as long-term data preservation, but in recognition of its potential for mobilizing documentation and strengthening languages, right now, when it is most needed.

Notes

1. In this chapter, I use "sound" to include both sound and video.
2. The term has since become more widely used (e.g. Wittenburg et al. 2004a; Austin 2004). It is related to, but greatly extends, the sense of "exploitation" used by Wittenburg et al. (2004a) to refer to using software to browse and analyze archive data. "Mobilization" is a more tasteful way of describing such activities in English, but does not offer that advantage in German.
3. They were adapted from Deborah Cameron, cited in Grinevald (2003).
4. In reality, there is still a wide gap between many elements of Woodbury's reconceptualization and the ways that linguists generally work with materials.
5. The term can be understood as referring to the previous constraints (rather than its actual capabilities) in the same way that *horseless carriage* and *wireless* named new technologies in terms of reversals of their predecessors (cf. McLuhan 1964).
6. Recently the meaning of "metadata" has been narrowed to refer to data that is not deemed to be "in" the linguistic event (e.g. the location or gender of the speaker) and used as file cataloguing data primarily for the purpose of resource discovery. Such metadata can be classified in terms of its various roles, e.g. in cataloguing, managing, or preserving the data (see Chapter 4).
7. Online at www.unizh.ch/spw/afrling/akandic/samples.htm; viewed September 2003.
8. Interface design is also known as Human Computer Interaction or User Experience Design.
9. Paakantyi is the language of the lower Darling River, NSW, Australia.
10. Or worse, an outsider's fantasized version of the culture.
11. The talking dictionary is described in more detail in Nathan (2006).
12. Karaim is an endangered Turkic language spoken in Trakai, Lithuania, and in Halich, Ukraine.
13. Bird and Simons (2003: 22) go as far as to advocate "an open source revolution."
14. All the examples discussed in this chapter were authored using Macromedia Director (www.macromedia.com).
15. It is possible that open-source authoring tools may become available, e.g. based on SMIL, but it is not clear when such tools may appear and how much authoring capability they might offer.