African Languages and Information and Communication Technologies: Literacy, Access, and the Future

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1. Introduction

Discussion of the "digital divide" – the uneven distribution of computers and internet in favor of certain regions and groups – has become commonplace in the discourse on global expansion of the "information society." Quite apart from assumptions regarding the value of internet connections, Africa, by and large, is considered to be on the disfavored side of the divide. Various statistics like low numbers of telephone connections, lack of electrification and high illiteracy have long characterized the continent, and now are joined, unsurprisingly, by low indicators for connectivity and access to internet and computers.

Most of the focus in this context is on the technical aspects of the divide, notably connectivity and access, but this paper will focus on a less talked about aspect – the linguistic dimension of the proverbial divide – and relate it to some other factors, notably literacy[1] and the aspects of access.

The idea for this paper came from two observations about African languages[2] and information and communications technologies (ICT),[3] and their intersection. The first observation is that discussions about the digital divide rarely do more than mention issues relating to language. The aspects of access that are part of this discourse, however, necessarily involve questions of choice of language, and these in turn relate to, among other things, basic literacy issues.

Second, in discussing ICT on the one hand and basic literacy on the other in multilingual contexts, which of course are the general rule across Africa, one notices some significant connections. One is of course the potential for computer and internet tools not only to enhance current literacy efforts, but also to open new possibilities for literacy instruction. Another is that some of the obstacles to the use of African languages in ICT – on the levels of policy, attitudes, and sometimes orthographic issues – are similar to those encountered in promoting African language literacy.

In considering the above two observations together, not only literacy but also an expanded view of "access" to technology that accounts for user profiles emerge as key factors to increased use of African languages in ICT. Indeed, literacy is an important consideration in a broader definition of access, and user skills for access imply other kinds of literacy.

In the following I will discuss these issues and several examples that highlight the abovementioned dimensions. In particular, two brief case studies involving multilingual ICT, access, and literacy issues illustrate some of the current dynamics and point to interesting potential roles for the diaspora[4] and international collaboration.

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[1] Literacy is used here in a more narrow definition focusing on reading and writing skills. The importance of the context of literacy is recognized, but the broader set of skills that are currently a concern of the field will be referred to as multiliteracy. Multiliteracy is sometimes used also to describe literacy in multiple languages.

[2] African languages here will be defined as those languages indigenous to the continent south of the Sahara and for which there is not a primary cultural center in another region.

[3] ICT is used here mainly in the narrower sense of computers and the internet. In wider usage it can also cover radio, telephones., and other electronic media.

[4] The emphasis here is on the so-called "new" diasporas: Africans who have migrated out of Africa or work overseas and who maintain linguistic and social ties to their communities or countries of origin.

2. African Languages and ICT: On the Periphery of the Information Society

2.1. Importance of the Issue

There are several reasons why African language use on computers and the internet are of interest:

- First, it is assumed that so long as a language is spoken and used in other spheres of activity, it is worth at least providing the opportunity for it to be used in various ways with the new technologies. (It is recognized that this may involve changes in the ways languages are used, perhaps analogous to what happens when written forms of a language are first promoted.)

- Second, such an opportunity becomes a critical concern since African languages are themselves important vehicles for the expression and generation of knowledge, but there is little organized educational activity beyond small-scale programs for adult basic literacy and a limited amount of first language instruction at the primary school level. ICT in African languages could be important in post-literacy and in dissemination and generation of knowledge.

- Third, reliance almost exclusively on English, French, and Portuguese for the transmission of information and new knowledge (see Enguehard and Mbodj 2003) puts people who are not skilled in these languages, and arguably the societies of which they are a part, at a disadvantage.

- The issue certainly goes further, as it is legitimate to ask what sort of future there is for languages that are not used actively in ICT.

2.2. Brief Overview of the Current State of African Languages and ICT

The relative level of use of African languages in computing and on the internet is hard to quantify but important to at least characterize. To begin with, it is clear that African languages are not yet widely used in the content of computing applications or on the internet. We can deduce this, for instance, from the lack of software localized even for major African languages and the infrequence and character of such web content as one does find in African languages.

This situation obviously arises from the underlying sociolinguistic, language policy, and educational contexts, though in this paper these will not be explored in depth. However, it is worth noting that computers and the internet, like formal educational systems a century earlier, have been introduced and disseminated as more or less monolingual media using one or another European language. This is a reflection of both the dominance of the languages inherited from colonization in ICT and the use of these languages by those people in Africa most likely to use the technology.

A quick overview of African language use in web content, e-mail, and other aspects of computing (including in non-internet applications and in localization of software), helps to elucidate the situation.

2.2.1. The Web

African languages are represented on the web, but not prominently as media of communication. There are few surveys that document this. A study by Diki-Kidiri and Edema (2003) did find a significant number of sites that treat African languages in one way or another, but these generally have minimal content in the languages themselves. A large proportion are sites about African languages, including online dictionaries and instructional pages. An informal survey done in 2001 as part of a larger report for the Swedish International Development Agency (SIDA) in Tanzania estimated that ten percent of websites with a Tanzanian focus had at least some Swahili content (Miller Esselaar Associates, 2001), but here too most of the sites did not have majority content in the language.

Other efforts to quantify web content by language worldwide do not to show even the most widely spoken African languages at all among the most represented, whereas some minority European languages with relatively few speakers are ranked.[5]

2.2.2. E-mail and E-mail Lists

E-mail has long been a significant use of internet in Africa. By its nature it is harder to track the contents but there is other information that can be used to get an idea of the use of African languages. For instance, there are as of this writing two web-based e-mail services that provide for composition in several African languages – Africast.com and Mailafrica.net. In addition there are a number of e-mail distribution lists in which much or most of the traffic is in one or another African language. In particular one notes several Hausa and Swahili lists in which these, probably the most widely spoken indigenous tongues on the continent are the primary languages of communication.[6]

2.2.3. Non-Internet use of African languages in computing

It is harder still to attempt to quantify the degree to which African languages are used in the content of computer applications in Africa, for instance on word processors for the production of printed documents. Certainly publication in African languages is computerized using specialized software, but use on public, office and personal computers is less visible.

One glimpse of African language use on computers in a Senegalese telecenter is given in a brief article (Elder 2002) that mentions use of Pulaar and Wolof. Also in Senegal, a local non-governmental organization, ANAFA,[7] has been doing computer training (including basic literacy) in national languages. Beyond such anecdotal evidence however, there are apparently no surveys of such non-internet use.

2.2.4. Software localization

Localization of software and web-interfaces for African languages is an area that has been getting increasing attention. The recent announcement from Microsoft Corporation (2004) concerning its increased work on localizing its software, including for Africa, simply gives this issue a higher profile. There have been other efforts for localizing software on smaller scales for several years.[8] One open-source localization project for South African languages, Translate.org.za, has received a fair amount of attention, and several based in Nigeria have begun work in recent years – Kọnyin,[9] Afárá,[10] and ALT-I.[11]

As for web-interfaces, the popular search engine Google has a program for localized versions that already have several African language versions translated by volunteers. A "V-webmail" interface was

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[5] A simple survey of websites by language done in 2000 by Vilaweb, the website of a Barcelona newspaper, showed many more pages for languages such as Basque and Slovenian (Pastore 2000) than for any language in Africa surveyed three years later (see Diki-Kidiri and Edema 2003). A follow-up to the Vilaweb survey which ranked the top 48 languages on the web found Afrikaans forty-second after the abovementioned languages, and Swahili last following, among others, Frisian and Faeroese (Mas 2003).

[6] These include "Kiswahili" http://groups.yahoo.com/group/Kiswahili/ , and for Hausa language: "Finafinan_Hausa" groups.yahoo.com/group/Finafinan_Hausa/, "HausaDaHausawa" groups.yahoo.com/group/hausadahausawa/, "Marubuta" (formerly "Littattafan_Hausa_na_zamani") groups.yahoo.com/group/Marubuta/, "Matasa" (formerly "Dandalin_matasan_hausa") groups.yahoo.com/group/Matasa/.

[7] L'Association nationale pour l'alphabétisation et la formation des adultes. See http://anafa.ouvaton.org/

[8] For example, a Somali language word processor, "Hikaadiye," is at least five years old – http://www.somitek.com/

[9] See http://www.konyin.com/

[10] See http://www.pin.itgo.com/afara/

[11] African Languages Technology Initiative. See http://www.alt-i.org/ and also Egbokhare (2003).

recently localized for Swahili.[12] There may be more of this sort of localization going on than is apparent.[13]

2.3. Reasons for Lack of Use of African Languages and ICT

Despite the examples cited in the previous section, African language use in ICT appears to be marginal in Africa. Why is that? First of all, the factors that define the digital divide also tend to minimize the potential for African language use in ICT. Connectivity is centered on cities and towns where official languages – the same languages that are dominant on the internet – may be more widely spoken. In addition, only people with means and education, who are also more likely to have facility in use of the official languages, can access computers and internet connections. The digital divide therefore is arguably more localized than bridged, being replicated on national and local levels along the lines of deeper social, economic, and linguistic divides.[14] In effect there are a number of related factors that disfavor languages not associated with wealth and power, even before one gets to language-specific issues.

The other reasons why African languages are not more used in ICT generally can be grouped into two categories: motivation (the will to use them) and structural factors that affect access and use (the means to do so).

2.3.1. Motivation

With regard to the motivation, it might be said that while those with access to computers tend to be people who are educated in and socialized to some degree to use the official languages and thus less likely to actively seek to use their first languages, those who use their first languages but not the official language tend not to be in a position to do much in this area even if they wanted to. Of course the issues surrounding use of the vernacular in Africa are complicated by factors such as status and attitudes towards what is indigenous vis-à-vis languages that are seen as providing more economic opportunity. It becomes easy for all to assume that ICT is for European languages.

Another motivational factor in the case of web content has to do with the intended audience(s) to which sites are addressed. Ballantyne (2002) proposes analyzing content in terms of two parameters: "expression," or whether the content is of local or international origin, and "application," or whether the audience is local or international. Much web content relating to Africa, even concerning African languages, and whatever the origin, has an external audience, and so would logically tend to use languages understood internationally. Also, much of the web content with intended local application originates from outside of Africa, where production of content in languages other than English, French or Portuguese is not an easy option.[15]

There is also a question about how much interest there is among foreign sponsors of ICT projects on or for the continent in considering the issue. In contrast with the situation say in India there is less of tendency to assume that local languages will be used on some level(s). One development expert based in Senegal who had years of African experience recently asked quite sincerely why someone who could read French would want to use another (i.e., an African) language.[16] This mindset is hardly

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[12]   See http://webmail.variomedia.de . One needs to have an account to fully access the service, but it is possible to see Swahili among the language options.

[13]   Localization extends to other ICTs as well. For instance, one project is localizing mobile telephone technology in Afrikaans, Sesotho, Swahili, Xhosa and Zulu (Shanglee 2004).

[14]   Another perspective is offered by Keniston (2004) who writes in terms of four digital divides of which one is linguistic and cultural. The other three are socioeconomic within countries, digital between North and South, and the gap between the technical elite and everyone else. A roundtable on the digital divide at UCLA considered "a whole range of digital disparity gaps" among which language issues figure prominently (Afnan-Manns and Dorr 2003).

[15]   Another way of looking at this content issue is that a lot of "local expression" to "local application" information that does take place in African languages simply does not yet find a place on the web (Ballantyne 2002). Local radio in rural Africa has filled an interesting niche in this regard.

[16]   This and similar comments heard in Africa seem to echo Keniston's (1999) observations concerning India: "It can be argued that, given the fusion of language, wealth and power in India, there is simply no market (and perhaps no need) for software in any language other than English. Asked about localization to Indian languages,

unique – an American also in Senegal who is connected with the Digital Freedom Initiative (DFI) there dismissed any consideration of providing for any national language use of the systems that that project is introducing there for several reasons including the multiplicity of languages, complexities in handling their scripts, and lack of literacy in them. He further offered the opinion that African language use in ICT is fifteen years off, if it ever happens.

Such argumentation in the end resembles the vicious circle of rationalization that tends to hobble foreign assistance to literacy efforts: it is sometimes argued on the one hand that printing materials in African languages is pointless since few people know how to read these languages, and on the other hand that it makes little sense to conduct literacy training in these languages since there is so little to read in them.[17]

However, even where foreign-funded initiatives would be more favorably inclined to multilingual ICT there is little incentive to initiate efforts for African languages. Communication with the BusyInternet center in Accra, for instance, yielded generally positive but ultimately unenthusiastic appraisals of the potential for providing basic Ghanaian language computing capacities to their systems.

2.3.2. Structural factors

There are several structural factors limiting African language use. Some of these relate to standardization of orthography, which in some cases is subject to change or individual experimentation,[18] and in more than a few cases varies for the same language across borders.[19] A significant number of less widely spoken languages apparently do not have any established orthographies.

Another factor is that of special characters used in many orthographies which required specialized fonts but now can use Unicode fonts.[20] This point, however, is still contested on the point that Unicode's provisions for certain diacritical characters used in some languages currently pose some inconveniences (see Tassé 2003). On the whole, though, the problem is that the use of Unicode is still not widely understood among technicians and systems administrators on the continent.

This in turn relates to a lack of intersection between language policies and ICT policies in most African countries. In fact, it appears that there is little collaboration between linguists and ICT technicians in Africa. Similarly, in development agencies there is generally a lack of knowledge about African languages and linguistics or about basic technical options to facilitate computing in multiple languages (especially in the case of extended scripts). The opinion of the individual with DFI mentioned above concerning the prospects for African languages in ICT is merely a more extreme example of lack of knowledge of the realities and possibilities.

Another structural factor that is as essential as it is obvious, relates to lack of resources to advance work in these categories, even where there is the will and know-how to implement multilingual ICT projects in Africa.

3. Case Studies

Two short project descriptions and some other examples illustrate some of the issues, including the potential for international and diaspora assistance with African language use.

3.1. Southern Sudanese Refugees, Literacy, and ICT

A group of southern Sudanese refugees in Melbourne, Australia is working with an office of the Victoria State Library there, on literacy in Nuer and Dinka languages. What is particularly interesting

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international software firms sometimes reply, 'But everyone speaks English in India,' by which of course they mean that the present market consists of people who speak English."

[17] The author has encountered such arguments in Niger.

[18] The choices by Echuero (1998) in his Igbo dictionary to substitute a dieresis for the subdot on certain vowels and /c/ for /ch/ is an example and one that was evidently controversial.

[19] Significant effort has gone into trying to harmonize transcriptions of cross-border languages, including international expert meetings several decades ago (see http://www.bisharat.net/Documents/).

[20] The various issues of African orthographies and ICT are surveyed by the author elsewhere (Osborn 2001).

about the effort in Melbourne is that it has resulted, through the collaboration of the Sudanese with Andrew Cunningham, Multilingual Technical Project Officer at the abovementioned library, in a set of web pages in Nuer that are intended to be a part of the literacy effort.[21] With the Dinka language there are additional complications because of lack of standardization of orthography and the fact that different dialects have tended to be treated separately.

One of the key people involved in the Dinka effort, Morwell Ater Morwell, had previously managed a center in Khartoum and one in Cairo before going to Australia (Cunningham 2004). However it does not seem to be an isolated phenomenon limited to this individual or community as there have been similar separate inquiries concerning the potential for literacy and maintaining language and culture from southern Sudanese people residing in Arizona and Tasmania.

These developments are still young, but it will be interesting to see how they work out and the degree to which diaspora communities will use the internet for maintaining contact with each other and their common languages and cultures. The extent to which all this may link back to Sudan is another question.

3.2. Oke-Ogun, Nigeria: A local/international project, ICT, and the Yoruba language

A small development project centered in the rural community of Ago-Are, Oke-Ogun district in southwestern Nigeria, that was inspired by a community member who was originally from that community but living in England, Peter Adetunji Oyawale, offers an interesting study of growth of an idea to incorporate ICT for local development. After Mr. Oyawale died tragically, a collaboration between the local group, Oke-Ogun Community Development Agenda 2000 Plus (OOCD 2000+), an English volunteer in the Committee for African Welfare and Development (CAWD), Pamela McLean, and a Kenyan VSO volunteer, David Mutua, have worked to carry forth his vision.[22]

The project has been working on, among other things, a some very basic information and connectivity issues on a small scale, and is looking towards further development. Computer access, such as it is currently, is only in English, but there is interest in how Yoruba will be handled. McLean (2004) writes:

> "If we are communicating information in the local language through infomediaries, and publishing printed materials, it makes sense to consider printing Yoruba versions, if enough people read Yoruba, or would like to read Yoruba. Adult illiteracy is widespread and is an issue that interests us. There are some local materials in Yoruba …"

With regard to the longer range technical and linguistic issues, the project has developed links both internationally and with other local initiatives, including ones with an interest in working in Yoruba (two organizations, OCDN and RUSEL have been mentioned).

3.3. Other Examples

The two above cases are not isolated instances. There are a number of websites on African languages, from sophisticated online dictionaries to individual initiatives that involve some text, created by Africans living abroad. A recent contact this author had concerning Nigerien language content from the creator of the Niger1.com site, based in New York, is just a recent example.

4. Redefining ICT Access in Africa: Multiple Languages and Multiliteracy

Just as the "digital divide" can be understood as many things, so too can "access," which is one of the factors usually cited in defining the divide. Although access is generally discussed without distinctions as a single phenomenon and goal, some sources have sought to distinguish between levels

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[21] See http://home.vicnet.net.au/~naath/ . A Dinka site is at this writing under construction at http://home.vicnet.net.au/~agamlong/ .

[22] Information on this has been provided by an English volunteer prominent in the work of the project, Pamela McLean, in the form of correspondence to the "Yoruba language & ICT" message board, http://www.quicktopic.com/15/H/KKgbRqJUAR8 , and information on the CAWD site, http://www.cawd.info

or types of access. Telecommons (2000) discusses "'physical access' to ICT infrastructure and applications, and 'soft access,' which we define as software and applications which are designed to enable rural African users to utilize ICTs for their own needs and uses once the physical access has been established." The organization Bridges.org goes further to define twelve dimensions of what it calls "real access,"[23] of which "relevant content" mentions language. In effect, two aspects of access – software and content – are ones in which choice of language is important (cf. the survey above, 2.2).

In the context of this discussion, access beyond physical availability of hardware and connections and the rights to use these must also include some anticipation of the user profiles in terms of, among other things, language and literacy. This in turn implies attention to developing user skills, including basic literacy.

As the Oke-Ogun example seems to indicate, however, once there is greater application of ICT on the local scale, the question of how to use local language(s) becomes inescapable. The issue of literacy in these languages follows logically.

To a certain degree one can provide computer access to people who cannot read text, through innovative use of the technology, e.g., audio and images, and text-to-speech processing. Such interfaces then imply other kinds of literacy – in particular computer literacy. This kind of consideration suggests widening both the kinds of ICT interfaces provided for and the range of literacies accounted for (multiliteracy). In effect ICT that can both be made accessible in some ways to illiterate or semiliterate people and assist in their education begins to imply new approaches both to ICT for development projects and literacy strategies where ICT is introduced.

5. Conclusions

Beyond redefining access to ICT in Africa to more explicitly recognize the importance of African languages, and situating the vital concern of literacy, beginning with basic literacy, in the more effective use of the technology, there are questions of who does what and with what means. Given some of the impediments to greater use of African languages in ICT an interesting consideration is what the international community with interest in African languages can do to favor more effective multilingual use of ICT to address longer term needs on the continent.

In this, the African diaspora's role may have been overlooked.[24] Indeed the existence of African language content created, initiated, or otherwise supported by Africans overseas points to interesting dynamics in a medium where distance does not matter so much. In particular, the example of the Sudanese in Melbourne seems to suggest a new twist on distance education via internet. Could such efforts by individuals and communities in the diaspora assist in more effective use of ICT, including for literacy, in their countries of origin?

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23 See http://www.bridges.org/digitaldivide/realaccess.html .

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Selected Proceedings of the 35th Annual Conference on African Linguistics: African Languages and Linguistics in Broad Perspectives

edited by John Mugane, John P. Hutchison, and Dee A. Worman

Cascadilla Proceedings Project   Somerville, MA   2006

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Osborn, Donald Z. 2006. African Languages and Information and Communication Technologies: Literacy, Access, and the Future. In *Selected Proceedings of the 35th Annual Conference on African Linguistics*, ed. John Mugane et al., 86-93. Somerville, MA: Cascadilla Proceedings Project.

or:

Osborn, Donald Z. 2006. African Languages and Information and Communication Technologies: Literacy, Access, and the Future. In *Selected Proceedings of the 35th Annual Conference on African Linguistics*, ed. John Mugane et al., 86-93. Somerville, MA: Cascadilla Proceedings Project. www.lingref.com, document #1299.