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African Language Needs in Information and Communication Technology (ICT)

By

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1. Introduction

On the advent of information and communication technology (ICT) and given the present clamor for the promotion of African languages, the question certainly arises as to what the needs are, that should enable these languages function smoothly in the new system. Identifying these needs appears a matter of priority if these languages have to play a role in development that goes beyond the rudimentary that has characterized language and education on the continent in the past. The question that readily comes to mind is what it is that makes other languages utilizable in ICT that African languages do not possess.

One observation that constitutes the specificity of African languages and which certainly plays against their full functioning within the ICT system is that the conception and operation of ICT are adapted mainly to Indo-European languages. It thus becomes extremely challenging, if not impossible, to integrate other languages into the process. And since African languages have a reputation for oral tradition, their involvement in modern science and technology is reduced to the strictest minimum. Languages that are not reduced to written development obviously lack the potential for expression and transmission of modern thought. Those that are written are very few and are not sufficiently developed to compete equitably with Indo-European languages.

Our goal in this paper is to make an inventory of some of the major needs of African languages in this area and to highlight their development priorities. However, we are not experts in ICT and so, it is possible that some of the issues we consider crucial here may not be relevant in the eyes of the experts.

2. ICT conception, adaptation and functioning in African languages

The fact that attention is starting to be paid to the role of African languages in ICT represents one of the noblest ideals and initiatives to be undertaken by African linguists in the present century. Until lately, the importance of developing African languages was limited to basic education and literacy. Even then, the concern was almost exclusively that of researchers so that written use of these languages in education still remains to a large extent today, an intellectual affair. The non-intellectual African public continues to perceive this option as illusionary and unrealizable. It has thus become a common assumption that these languages cannot be used in advanced learning. This attitude has two major implications. First, it has contributed greatly to the absence of advanced research in the area so that crucial issues of language promotion like terminology development in specific areas of the social and natural sciences have not been addressed. Second, ICT development is the product of advanced learning so that languages not exposed to this learning cannot possibly have the potential for accommodating the system.

The domain of ICT, therefore, in every respect, is much more complex to handle as far as African languages are concerned. If the use of these languages in basic learning is not yet an achievement, how more challenging will it be in ICT? Can languages, a majority of which exists exclusively through oral tradition, be functionally involved in ICT? What are the possible development requirements for these languages to participate in the ICT system? These and more related questions need to be urgently addressed if Africans hope to participate meaningfully in ICT. The different levels of priority of the needs involved will also need to be defined. Diagnosing and addressing these problems will certainly pave the way for African language integration into the ICT system.

3. Language, technology and development

All development, whatever its orientations, is a language issue. The conception and execution of development projects have their basis in language. Although conception takes place in the mind, this cannot, in fact, do so in the absence of language. Development in itself is only the product of psychological processes in a given cultural context and at a given historical moment. These processes are then reduced to writing and then constitute the content of learning first for the communities concerned and then for those communities that perceive its utility.

The issue of language, technology and development is, therefore, a matter of language, culture and education. Even though the consumption of ICT is globalized today, it is indubitable that its development is context-specific. This context is to be defined in terms of the language, the culture (values), education promoted, and the economic and political aspirations of the communities involved. If this were not the case, then it would be possible at any time for African languages to be integrated into ICT. But because this is a specific development of a specific society, conceived and adapted to serve the development and expansionist needs of that society, it becomes practically impossible to insert other languages and cultures into the system. What is actually happening then is that Africans whether through their languages or Indo-European languages cannot, for the moment, fully utilize ICT because its conception was never intended to meet their development needs.

Development projects take concrete shape through communication in a language of some kind so that language becomes a resource whose utility cuts across domains and disciplines. The African linguist, by virtue of his/her vocation is concerned with studying and analyzing phenomena and providing scientific data required for boosting and sustaining development in the society. However, ICT development, like all other areas of human development, makes use of language more as a tool than as an integral component of the process. The challenge of the African linguist in this century will be to relate language to all development endeavors. ICT should, as a matter of fact, be a priority concern in this process.

4. ICT as a global framework for information and communication access

It is today, generally agreed that ICT has broadened the communication gap between the advanced and poor countries. Within the last few years, therefore, a lot of attention has been paid to the necessity to significantly reduce this gap. UNESCO has played a central role in this process by organizing a series of world conferences to reflect on and adopt strategies for equitable access of all communities to information. In one of these conferences held in 2000, discussions focused on the ethical, legal and satellite challenges of cyberspace, Info-ethics. The conference stressed on the necessity to preserve and reinforce human rights principles in the new digital environment and cyberspace. It emphasized on the need for the rights of access to information for all to remain a fundamental right to be upheld with greater efficiency and imagination in a spirit of equity, justice and mutual respect (UNESCO, 2000:2-3).

This concern makes it not only legitimate but also noble for African experts in information and communication to reflect on ways and means of integrating African languages into ICT. If the processes of information and communication center on language, then for African countries, this would normally require undertaking innovations that will enable African languages to become part of ICT systems and processes.

5. African languages Needs in ICT

The views presented above reveal that there exist needs, which if met would enable African languages to function meaningfully in the ICT process. But what are these needs and how can they be met?

Given the present state of ICT development, and considering the degree of written development of African languages, it seems that we can classify these needs into three main categories as follows: user oriented, programmer oriented and technician oriented categories.

5.1. User oriented needs

These are needs that facilitate the consumption of ICT by target communities. Here there are three specific needs namely, web sites, e-mail dictionaries and menu items.

5.1.1. Web sites

For African languages to be integrated into the system as co-media, and not simply consumer languages, web sites have to be created in and not for African languages. It is important that we no longer depend on the facilities put in place by others but get down to establish computer systems that effectively respond to the needs of development and communication in African languages. Web sites constitute access to information conception, transmission and reception.

Recent developments in this area make it possible for web sites to be created in any languages so that web site development in African languages is, therefore, no longer an impossibility, but rather a matter of interest, commitment, time and material investment. For instance, there is the need to determine the content of the sites, the financial resources as well as the personnel required for animating them.

5.1.2. E-mail dictionaries

ICT centers on global communication techniques and facilities. The e-mail system is at the core of this system. One of the greatest strengths of the system is the dictionary which enables it, depending on the commands passed, to check, identify and correct mistakes and errors relating to spelling, grammar and syntactic structure of written sequences of information. Dictionaries represent growth in the written development of a language and permit literate users in all domains of information and communication to ensure quality of written expression. Initially, these dictionaries should be multilingual, at least trilingual, to meet the literacy and communication demands of the multilingual African society. This means that Africans should be able to use their mother tongues, foreign official languages and official national languages within the ICT system.

But dictionary development is not an easy task to accomplish as it entails a lot of time and effort. At present, a majority of African languages have not yet reached this phase of development. In a good number of situations, there exist small volumes of bilingual (MT-OL) dictionaries but as yet, very few of these languages do possess monolingual dictionaries. Ideally, the involvement of African languages in ICT should aim, eventually, at monolingual dictionaries.

5.1.3. Menu items

Menu items permit users to access computers and to carry out operations. But these items, as usual, are made available only in the world languages. Already, some software systems permit the development of menus in any language so that the problem seems to lie more with the need for generalizing the process in all software systems. Like in most ICT situations, this requires a lot more effort for its realization. Items such as file, edit, view, format and tools are necessary in accessing different programs in the computer system. All these need to be developed in African languages. This requires not only specialized programs but also computer programmers. And as will be expected, Africans are specialized more in computer operations than in their programming. This means paying particular attention to training in computer programming as the basis for equitable access in ICT systems.

What the above situation signifies is that particular attention has to be paid to the development of the necessary human resources through specialized training for Africans in computer programming. ACALAN, in its capacity as the continental framework for language development and use, should make of this one of its major goals.

5.1.4. Wide audience

ICT system operation is global. It is programmed to reach out to as many people as possible across the globe. This audience, thanks to its exposure to the dominating influence of the world languages, learns and communicates in these languages. On the other hand, a majority of African languages are not written and do not serve as instruments of basic and advanced learning and as such have a limited audience of users.

For any headway to be made in the process, many more Africans need to be rendered literate in African languages particularly those adopted for ICT use.

5.2. Programmer oriented needs

Programmer oriented needs are those that involved special computer programs for realizing specific African language development goals. The issues to be addressed here include computer programming, software systems and linguistic tools.

Computer programming

The greatest need is to be felt in the area of computer programming. ICT centers on computer technology. But so far, programming in this area exists exclusively in world languages. This is normal given that the technology involved is the exclusive property of the societies that own these languages. Moreover, language accessibility has been facilitated by the fact that these so-called world languages have a high level of development and geographical spread across the world and so enjoy a very large audience.

Many programming languages today, allow a fair bit of flexibility in the languages used to write them. For instance, many French programmers write programs using languages developed in the United States. These programs might be for the French market and may not have any English appearing as part of the final product although the program was written using largely English based vocabulary. Since this is done for other major languages around the world, it cannot be argued strongly that Africans must program in an African vocabulary. But if need be, it could be done in exclusively African vocabulary. In any case, this should not be an issue for major debates as the real needs are most likely to naturally determine the orientations to be adopted.

5.3. Technician oriented needs

At this level, needs have to do with technical issues that enhance language use in ICT.

5.3.1. Computer configuration

Initially, the configuration of most computer programs left very little possibility for African languages to function in the ICT system. However, in recent times, some systems have begun to allow configuration in African languages. This is the case with the Linux open source system. This system translates the menus and user interface into

various languages. The underlying documentation is one of the last things to translate because it is extremely voluminous. This would be an example of a system that supports African language development in the present century.

However, African languages need to go through the user interface and create appropriate terminology for the translation of the various prompts and responses. Various commands, inevitable in executing computer operations, need to be available in African languages such as send, compose, save as, delete and save. It is, therefore, essentially an issue of documentation, to be addressed through translation. Of course, it is a really big issue given the time, human and material resource implications that go along with this.

5.3.2. Satellite technology

Like computer programming, ICT operates thanks to satellite technology connections. The production, storage and transmission of messages take place thanks to satellite technology. Regrettably, this technology is developed to serve exclusively the needs of world languages. If Africans languages have to be used in ICT, then it will be vital that satellite installations for reception, processing and transmission of information be programmed in these languages.

This inevitably calls for huge investments to put in place the equipment, personnel and management systems of satellite communication. In other words, investment is needed in the material, financial and human resource levels to operate satellite systems.

5.3.3. Software systems

Computer technology operates at two main levels; the hardware and software levels. The hardware level is concerned with information storage while the software level has to do with different programs. It operates at the level of systems and at the level of application. The level of systems controls that of application and so determines its functions and the types of commands to be made in computer operations. This means that for African languages to function in ICT, software systems need to be developed in these languages.

An emerging technology in this area is voice activation through which machines understand spoken speech. IBM and Microsoft are presently making major breakthroughs in this direction. IBM has just released software to the open source community to do this and Microsoft has a product for people designing programs that recognize spoken speech. Also, there is software for language learning. In the US, SIL is developing an agreement with Language Transparent Systems that produces language software in many languages. These kinds of systems need to be developed for African languages.

In future, therefore, we will have machines coming out that accept voice commands and which serve as language learning resources. This will be particularly useful given that Africa is a typical oral society that deserves study and development.

5.3.4. Linguistic tools

By linguistic tools, we mean the resources that are needed to promote the use of African languages on the Internet. Promotion of languages in any form requires special terminology that responds to communication and information needs in various domains and disciplines. In this case, terminology banks, bilingual/multilingual search modules as well as specialized software such as translation bureaus and publications will be required. It is worthy to note that terminology development, its importance notwithstanding, is an area of development of African languages that has received very little attention among language specialists on the continent.

6. Prioritizing these needs

Given the complex linguistic situation of Africa and considering the level of development of its languages, it stands out clearly that for these languages to operate in ICT, the prioritization of the needs of these languages becomes a matter of great necessity. This is an area where not only linguistic but also really technical input is vital.

Some of the major issues to be addressed here will include the written development of African languages to operational levels in ICT and the definition of the statuses of the languages to be initially introduced into the ICT system. Equipment acquisition and accessibility as well as human resource development are also areas to be carefully considered. But above all, there is need to plan for financial investment given that ICT entails heavy costs at all levels of operation. The process of prioritizing these needs is a collective endeavor involving all the stakeholders, namely linguists, governments, intergovernmental organizations, African language NGOs, etc.

7. Conclusion

We have attempted an inventory of some of the African language needs in ICT. Our research is, however, limited in the sense that we are not experts in the area of information and communication technologies. It is thus possible that what we consider to be crucial needs may not be relevant in the eyes of experts. Our hope is that this constitutes the basis for more fruitful and collective reflection in this respect.

The use of African languages in ICT is vital in a globalizing world so that the interest currently manifested in the domain needs reinforcement. Also, attention needs to be paid to practical development initiatives that enhance the promotion of modern information and communication technologies in African languages. To do this, these languages, especially those adopted for the purpose, need to attain acceptable levels of written development. This should form the basis for ICT development in Africa for Africans.

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