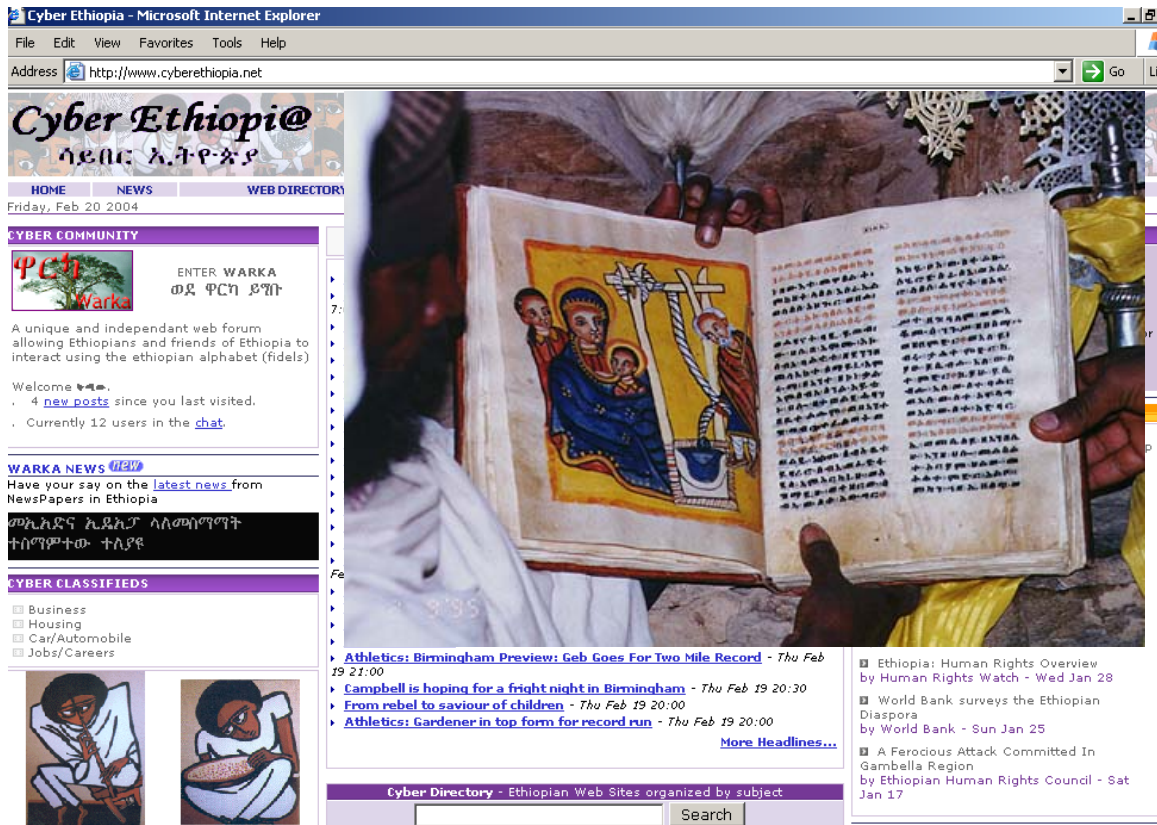


Cultural identity and local content development on the World Wide Web

The CyberEthiopia initiative



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Table of Contents

Introduction	3
Background	3
About fidels (Ethiopian Alphabet)	4
Importance of Cultural identity and local content development for Ethiopians	5
Computerization of the Ethiopic Alphabet	5
Reconfiguration of Ethiopia in the global era	7
The CyberEthiopia Initiative	8
What is CyberEthiopia	8
Objectives of CyberEthiopia	8
Some key figures about CyberEthiopia (as of April 2004)	8
What we have implemented to date (as of April 2004)	9
Conclusions	14
Acknowledgments	16
References	17
Annexes	18

Introduction

The rise of Information and Communications Technologies (ICTs) in recent years has undoubtedly accelerated the pace of globalization. In a more and more globalized world, least developed countries such as Ethiopia have little or no margin of action as they try to position themselves into the so called Global village.

The global era and the advent of the Information Society demonstrates the need for Ethiopians not only to develop their information and communication infrastructure but also create an enabling environment for information and knowledge sharing with their own alphabet.

The endemic risk of being left behind and further marginalized can only be eliminated with the digital inclusion and full participation of Ethiopians in the Information Society, especially the young people and the future workforce.

Thus the need to underline the fact that Ethiopians should adopt and adapt emerging technologies, make appropriate use of them as to stimulate development while paying particular attention to the preservation and affirmation of their heritage, their cultural and linguistic legacies.

Background

Ethiopia has this particularity of having its own script used for written communication since 100 BC.

The multilingualism and the development of the local script present challenges with respect to Ethiopians' full participation in the information society, especially in terms of development and promotion of local content.

The development of ICT infrastructure and human capacity building is a key factor to Ethiopians' participation in the Global Information Society.

This discussion paper **will not** address the above critical issues.

It will rather attempt to underline the linguistic and cultural insight to bear on the design and deployment of emerging technologies, particularly for rural, non-elite communities in countries like Ethiopia.

It will also highlight the challenges related to development of local content, Information and knowledge sharing applications with indigenous Ethiopian alphabet by elaborating few of the initiatives made by CyberEthiopia.com in that aspect. The paper then suggests a practical use of these technologies to further develop dialogue and networking among Ethiopians World Wide in the global era.

About fidels (Ethiopian Alphabet)

Africa's Oldest Alphabet

Ethiopic, Africa's oldest alphabet still in use today, dates back to 100 BC. It is a system used to write the Ge'ez literary, ecclesiastical languages? Amharic, Tigré, and Tigrinya languages of Ethiopia and today's Eritrea. Both Ge'ez and the related languages of Ethiopia are written and read from left to right, in contrast with the other Semitic languages.

Ethiopians call their alphabet "fidel." The Ethiopic alphabet consists of 26 letters, all representing consonants, that can be transformed into syllabic symbols by attaching the appropriate vocalic markers to the letters.

Ge'ez Language

Ge'ez, the ancient language of the Aksumite empire, is used today only for religious writings and worship in the Ethiopian Orthodox church. The ancient Ge'ez language is the ancestor of the modern Tigrinya and Tigré languages of Ethiopia and Eritrea. The oldest known inscription in Ge'ez dates from the 3rd or 4th century. The Bible was translated into Ge'ez between the 5th and 7th centuries. The period of classical Ge'ez literature was between the 13th and 17th centuries. Although Ge'ez ceased to be spoken popularly sometime between 900 and 1200, it continues as a liturgical language.

Amharic Language

Amharic is the official language of Ethiopia and is native to the central and northwestern provinces. Nearly one-third of the population speaks Amharic. It is an Afro-Asiatic language of the Southwest Semitic group and is related to Ge'ez, or Ethiopic. It also has affinities with Tigré, Tigrinya, and the South Arabic dialects. Although the oldest extant records in Amharic are songs and poems dating from the 14th century, significant literature did not begin until the 19th century.

Amharic is written in a slightly modified form of the alphabet used for writing the Ge'ez language. There are 33 basic characters, each of which has seven forms depending on which vowel it is to be pronounced in the syllable. The language has been strongly influenced by the Cushitic languages, especially Oromo. The dialects of Amharic are not strongly differentiated from one another.

Ethiopia's Languages Groups

Ethiopia is a mosaic of about 70 languages that can be classified into four groups--Semitic, Cushitic, Omotic, and Nilotic. The Semitic languages are spoken primarily in the northern and central parts of the country; they include Ge'ez, Tigrinya, Amharic, Gurage, and Hareri. The most important Cushitic languages are Oromo, Somali, and Afar. The Omotic languages, chief among which is Walaita, are not widespread, being spoken mostly in the densely populated areas of the extreme southwest. The Nilotic language group is native to the Western Lowlands, with Kunama speakers being dominant.

**Language -Mother Tongue and 2nd Language of the 5 Largest Ethnic Groups In Ethiopia
1994 Census (in million)**

	1. Mother Tongue		2. 2 nd Language		1 + 2	
	No.	%	No.	%	No.	%
Amharic *	17.4	32.7	5.1	9.6	22.5	42.5
Guragigna	1.9	3.6	2.1	4.0	4.0	7.5
Oromigna	16.8	31.6	1.5	2.8	18.3	34.5
Somaligna	3.2	6.0	0.1	0.2	3.3	6.2
Tigrigna *	3.2	6.0	0.2	0.4	3.4	6.4
<i>Sub-total</i>	<i>42.5</i>	<i>79.9</i>	<i>9.0</i>	<i>17.0</i>	<i>51.5</i>	<i>97.1</i>
Grand Total	53.1	100	53.1		53.1	

Source: Adapted from Central Statistical Authority (Ethiopia) 1998

* Afro-Asiatic language of the Southwest Semitic group currently using Ethiopic Alphabet

Importance of Cultural identity and local content development for Ethiopians

All stakeholders of the Information Society declare as a principle the importance of the promotion, affirmation and preservation of diverse cultural identities and languages as reflected in relevant agreed United Nations documents including UNESCO's Universal Declaration on Cultural Diversity.

As a country with diverse cultural, linguistic and historical heritage, this principle has a particular importance to Ethiopians.

Preservation of cultural heritage and linguistic legacy is a **crucial component of identity and self-understanding of individuals** that links a community to its past.

The particularity of using ethiopic script for written communications creates even more challenges in the full participation and contribution to the information society and their ability to use the opportunities such a society could offer to their development.

Computerization of the Ethiopic Alphabet

Although there are many ingenious endeavors in computerizing the Ethiopic Alphabet, the work done so far is not yet entirely suited for real information processing.

Today, there are over 40 Ethiopic word processing software products available, each with its own character set, encoding system, typeface names, and keyboard layout.

There is an obvious lack of standards in the computerization of the Ethiopic Alphabet despite the attempts of several associations to harmonize the Ethiopic Character sets in order to have a unique encoding system.

An encouraging development is the inclusion of the Ethiopic character set in the Unicode¹ 3.0 standard released in the year 2000. Unicode provides a unique number for every character, no matter what the platform, no matter what the program, no matter what the language (See Annex 1).

A small number of word processing software vendors have adapted their fonts to comply with the Unicode standard. However, many applications and operating systems do not yet fully support the Ethiopian Character sets.

¹ The Unicode Consortium is a non-profit organization originally founded to develop, extend and promote use of the Unicode Standard, which specifies the representation of text in modern software products and standards. (see excerpt from the Ethiopic character code in Annex)

The keyboard layouts for latin/ethiopic transliteration is also as diverse as the word processing developers. The keyboard layout may not necessarily be unique as to give users the choice of their preferred layout. However, there should be a limited set of known, standard layouts that are familiar to all, irrespective of the vendors' implementation.

A national committee should undertake this task and produce a standard to be adopted by all word processing softwares and other ethiopic applications.

The challenges of Ethiopic Web Publishing

In the early days of the World Wide Web, browsers allowed only ASCII text and images to be displayed. At the time, in order to publish an ethiopic character, one had to take a picture of the character and publish it on the Web as an image: a cumbersome and inefficient procedure still used by many today.

At the end of 1995, Internet browsers included support to different fonts typefaces. The user could then download and install a specific ethiopic font and view ethiopic documents through the Internet browsers.

Unless fonts are installed on the user's PC, today there is no reliable and efficient mechanism allowing Ethiopic web publishing on all platforms.

Some font embedding tools are useful to tackle the font downloading requirement. They are nonetheless not available for all browsers and operating systems.

Portable Document Format (PDF), a standard adopted by governments and enterprises worldwide can be a reliable format for ethiopic electronic document exchange. It preserves document integrity so files can be viewed and printed on a variety of platforms.

PDF is practical for downloading ethiopic documents that require standard printing but can not be considered as an efficient and universal way for ethiopic web publishing.

There are many constraints in ensuring an ethiopic web page to be viewed as desired by any user, any browser and any platform.

Unicode promises to remove some of the existing constraints for ethiopic web publishing ensuring the production, viewing and publishing of any ethiopic material on the World Wide Web and allow document exchanges without any compatibility issues.

Reconfiguration of Ethiopia in the global era

Prof Donald Levine in "Reconfiguring the Ethiopian Nation in a global era" : paper presented at the Fifteenth International Conference on Ethiopian Studies, Hamburg University, July 23, 2003 writes :

The Globalizing tendencies favored by electronic media and easy transportation will play a major role in strengthening the age-old nation reconfigured in three parts :

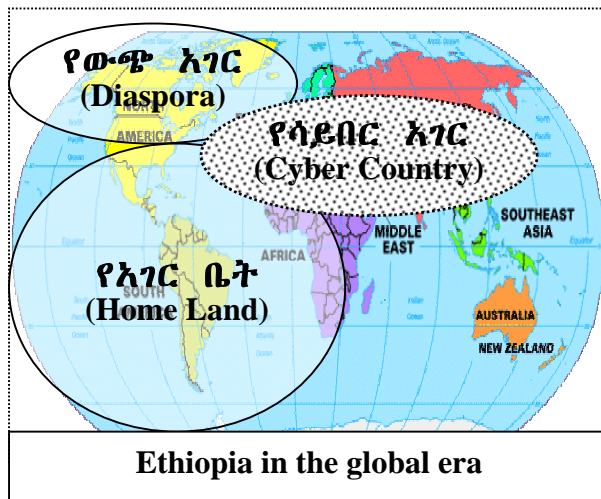
- የአገር ቤት (Home Land)
- የውጭ አገር (Diaspora)
- የሳይበር አገር (Cyber Country)

The aftermath of the political turmoil that followed the 1974 revolution in Ethiopia has triggered a migration of a lot of ethiopians overseas. The pace of the drain has not slowed down since. Sadly, there is very little likelihood that a massive return or slow down of this trend will take place in the near future.

There is, however, a light in tunnel to use this drain for the country and give Ethiopia a chance to participate in a new revolution - The Information and Technological revolution.

Indeed, the advent of the Information and Technological revolution can be an opportunity for further linking Ethiopians inside or outside the country and or even reverse the brain drain.

The Ethiopian diaspora is at a relatively infantile stage. There is a growing awareness and will to organize, build a strong and influential diaspora for the development of the country. In that context, ICT can easily be an instrumental in further connecting the diaspora to the homeland and turning it into a real asset for the country.



The CyberEthiopia Initiative

What is CyberEthiopia

CyberEthiopia is a pioneering information gateway to all that is Ethiopian on the World Wide Web.

Created in 1996, CyberEthiopia is a non-profit foundation based in Geneva, Switzerland run by young dedicated individuals who believe that the adoption, adaptation and development of Information and Communication Technologies can be an enabling instrument and play a catalyst role in bringing development to the country.

Without any funding or commercial interest, CyberEthiopia is the result of few individuals who devoted their time and know-how to set some foundation for Ethiopians to participate in the Information Society and stimulate awareness among decision makers and ethiopians at large about the critical role ICTs play in the global era.

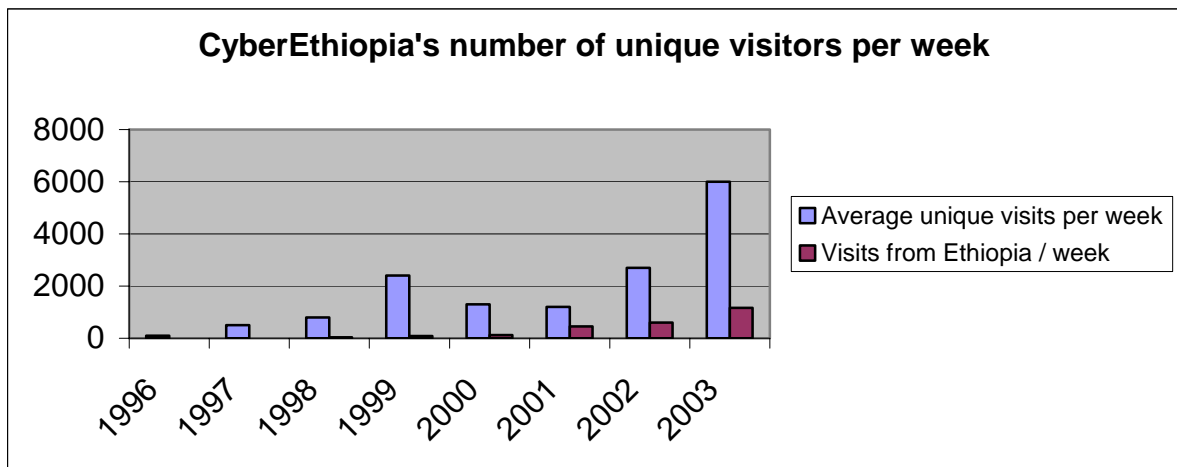
Objectives of CyberEthiopia

- Be a reference on the World Wide Web for timely, relevant and accurate information related to Ethiopia *[Information]*
- Develop and promote technologies that push forward the use of the millenary Ethiopian characters on the Internet *[Technology]*
- foster dialogue, collaboration and knowledge sharing among Ethiopians (both inside and outside the country) in particular by offering appropriate e-forums in local Ethiopian languages as it fits a democratic, free and prosperous Ethiopia *[Communication]*
- Initiate an Ethiopian "cyber" culture by encouraging information exchange and content creation in local Ethiopian languages *[Cultural Heritage]*
- Stimulate basic e-commerce of items related to Ethiopia (Books, CDs, Arts & Decorations) *[E-Commerce]*

Some key figures about CyberEthiopia (as of April 2004)

- On average ~ 7000 unique visitors per week
- On average ~ 50000 page views per week
- Over 6000 subscribers to the e-lists
- Over 4000 registered to your_name@CyberEthiopia.com
- Popularity based on search engine ranking for the keyword "Ethiopia"

Search Engine	Rank
MSN	1
Altavista	1
Lycos	2
AlltheWeb	2
Google	3
Yahoo	3



Source : CyberEthiopia Access logs. Note that this figures are averages and should be considered as indicators.

It is interesting to note the constant increase in the number of visits from Ethiopia. From 0.04 % in 2000, it was about 18 % in 2003. The recent figures of April 2004 indicate that the number has grown to 20 % making one out of five of the users of CyberEthiopia from Ethiopia.

The low teledensity of 0.53 (2002), the small PC penetration of below 100 000 (2002) combined with the high Internet Tarrifs (see Annex 2) are certainly among the main reasons of this relatively small number of users from Ethiopia.

What we have implemented to date (as of April 2004)

Be a reference on the World Wide Web for timely, relevant and accurate information related to Ethiopia [\[Information\]](#)

- **CyberEthiopia News**

CyberEthiopia's News Updates is an area where one can get news items pertaining to Ethiopia from major news sources on the Internet. It allows Internet users to get timely information on latest issues and facilitates access to current news avoiding them the time-consuming task of searching news sites.

The automated programs crawl major news sites on the Internet and bring pointers (hyperlinks) to news related to Ethiopia to our news archiving database, a very good starting point for researchers, and media professionals to search for references into our news archives.

To date, no filtering is done as to leave the users decide what is relevant and trustworthy.

CyberEthiopia News service attempts to be as comprehensive, factual, accurate and up-to-date as possible, but makes no warranties or representations, either expressed or implied, as to its accuracy or completeness.

CyberEthiopia.Com reserves the right to remove links to suggested sites, to make changes at any time, without prior notice.

Cyber Directory - Ethiopian Web Sites organized by subject

| [ሳይበር ኢትዮጵያ](#) > [የኢትዮጵያ ዌብ ሳይቶች](#)

| [CyberEthiopia](#) > [Directory](#)

- [Arts & Literature](#) (32)
[እርት እና ሰነድ ጽሁፍ](#) - ፴፪
- [Business & Economy](#) (38)
[ቢዝነስ እና ኢኮኖሚ](#) - ፴፰
- [Culture & Society](#) (55)
[ባህልና ሕብረተሰብ](#) - ፶፫
- [Education](#) (32)
[ትምህርት](#) - ፴፪
- [Government & Politics](#) (24)
[ፖለቲካ እና መንግስት](#) - ፳፬
- [Health & Medicine](#) (16)
[ጤና እና ሕክምና](#) - ፲፮
- [History](#) (13)
[ታሪክ](#) - ፲፫
- [News & Media](#) (23)
[ዜና](#) - ፳፫
- [Opinions & Articles](#) (65)
[ጽሁፎች እና አመልካክቶች](#) - ፳፫
- [Personal Home pages](#) (3)
- ፫
- [Science & Technology](#) (36)
[ሳይንስ እና ቴክኖሎጂ](#) - ፴፯
- [Sports](#) (8)
[ስፖርት](#) - ፰
- [Travel & Tourism](#) (19)
[ተሪዝም](#) - ፲፱

CyberEthiopia Community Networks (Warka Forums) [Communication]



The Warka tree is native to Ethiopia and has an enormous trunk with tapering branches and can attain a maximum height of 75 feet and maximum diameter of 60 feet around the trunk. It is also one of the longest lived trees in the world. It is the traditional place where villagers gather to discuss on social and community issues.

On the CyberWorld, WARKA is a unique and independent web based forum allowing Ethiopians and friends of Ethiopia to discuss over the Internet, using the millenary ethiopian alphabet (fidels). Created in June 2000, it has evolved a lot since its initial launch, becoming one of the most used discussion forum gathering Ethiopians from all corners of the World.

Warka (**ዋርካ**) community network's primary objective is to foster dialogue, collaboration and knowledge sharing among Ethiopians (both inside and outside the country) through appropriate e-forums in local Ethiopian languages as it fits a democratic, free and prosperous Ethiopia.

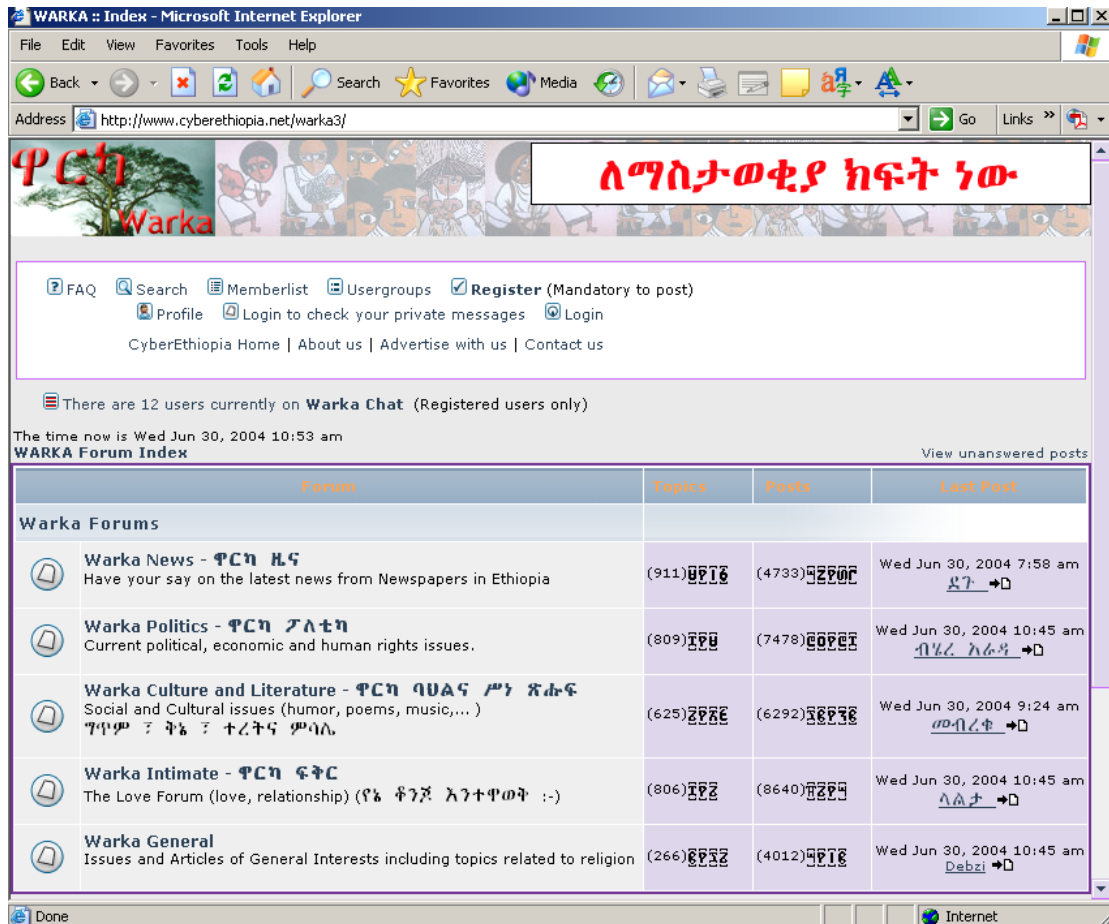
WARKA (**ዋርካ**) community network is :

- a non-partisan and independent ethiopic based web forum made by Ethiopians for Ethiopians and friends of Ethiopia
- unique in allowing Ethiopians to discuss over the Internet using their alphabet (fidels).
- open to all, free, and not moderated (i.e. uncensored).

WARKA (**ዋርካ**) community network rules and regulations stipulate the following principles :

- Exchanges of views must be **constructive** and must be conducted with **respect, civility** and a minimum of **courtesy** as fits a democratic and free forum and the best of Ethiopian culture.
- Insults, abusive, obscene, vulgar, slanderous, hateful, threatening, sexually-orientated or any other material that may violate any applicable laws are not tolerated on Warka forums.
- Individuals who systematically agitate in favor of the division of Ethiopians along ethnic, tribal and religious lines will see their messages deleted and their access denied.

Some statistics about Warka	
Number of posts	29 093
Number of registered users	6 540
Posts per day	132.73
Views per day	8456



Warka (ቅርን) Community Network

Cyber Postabet and the Ethiopic Input Interface [Communication/Technology]

Cyber Posta bet's goal is to allow ethiopic messages to be exchanged through email addresses. It is an implementation of the concept of "store and pick" commonly used by a lot of "E-postcard delivery services".

Our longer term goal is to enhance this service to a web based, secured email tool that allows ethiopic messages to be exchanged over the Internet.

Conclusions

The following points are suggestions and ideas that would better help fulfill the objectives of CyberEthiopia and encourage the beneficial use of emerging technologies by Ethiopians at large.

The need for true multilingualism as well as the principle of localization is indeed often mentioned by the major actors of the Information Society including giant software vendors like Microsoft, governments and other stakeholders.

However, existing situation with respect to multilingualism on the World Wide Web and the development of local content in the Ethiopian case is not fully satisfactory despite the numerous endeavours.

Various professionals and companies are using some ad hoc yet ingenious solutions that are, in general, incompatible with each other and that are not adequately suited for real processing and exchange of information.

This difficulty has been the result of a number of factors such as :

- the absence of national and international standards for Ethiopic character set encoding;
- the lack of support of Ethiopic languages from major software platform providers (probably related to an assumption of scarce business potential);
- the lack of coordination among the various efforts.

Some of the above difficulties have also been experienced by other similar communities who have their own scripts (Korean, Japanese, Arabic etc) and have been tackled appropriately through proper standardization over time.

There are, however, many encouraging developments in the right direction such as :

- the inclusion of the Ethiopic character set in the Unicode 3.0 standard.
- the recent announcement of Microsoft to work with the Ethiopian government and other national companies on localizing their XP and Office suite with an Ethiopic Local Interface Pack.
- the establishment of ECOSA (Ethiopian Computer Standards Association)
- the impressive initiatives of various Ethiopian professionals in the world of Open Source products that are not widely exploited in the country but can offer tremendous opportunities for developing countries like Ethiopia.

For Ethiopians to fully participate in the so called global information society and benefit from it:

- Their character set (Ethiopic) needs to be fully supported by all ICT products including internet domain names despite the unattractive business potential for the work;
- A national body that undertakes extensive research work in the development of local content should be formed.
- Resources and technical assistance should be allocated for endeavors in using Ethiopian languages for developing local content including digitalizing indigenous knowledge.

- A national Internet Society (Ethiopian Internet Society) and professionals network should be formed aiming to foster the use of the ICTs for information exchange, transfer of knowledge, development-centered applications in education, health, governance, commerce and public administration as well as the contribution of the Diaspora to the homeland.

Linking Professionals through CyberSpace

To date, as indicated by the access figures and probably due to the very low Internet penetration and high Internet tariffs in Ethiopia, the large majority of CyberEthiopia users are Ethiopians in the Diaspora. Therefore as of today, CyberEthiopia's focus should be directed more towards exploring how to best use emerging technologies for further linking professionals aspiring to participate in the development of their country while building an Ethiopian specific cyber culture and collaboration spirit.

Therefore, as part of its objective (3) which aims to "*foster dialogue, collaboration and knowledge sharing among Ethiopians in particular by offering appropriate e-forums in local Ethiopian languages as it fits a democratic, free and prosperous Ethiopia*", CyberEthiopia is willing to kick-start a World Wide Ethiopian Professionals Information Exchange Network (EPIEN) that would include professionals (both inside and outside the country) in different fields to identify key areas of collaboration and define tangible development projects that would contribute the prosperity of the country.

We call upon all Ethiopians and friends of Ethiopia in various field of expertise (Health professionals, engineers, economists, agronomist, authors, journalists, businessmen, politicians etc) to **reflect and act on** how to build this network, how to best use and get real benefits from these emerging tools and turn the Diaspora into a real asset for the country.

Let us think global, but act local !

Acknowledgments

- My brother Beruh, Senior Software developer (the Java man !), whose contributions were instrumental in making CyberEthiopia a glimpse of reality
- Daniel Yacob, Manager of Ethiopian News Headlines, for facilitating an effective collaboration between CyberEthiopia and ENH in addition to his numerous contributions in bringing ethiopic to the Open Source arena.
- Alexander Maffi, Content Research Coordinator, whose inputs are essential to the CyberEthiopia's Internet Directory of Ethiopian resources on the Web.
- Dawit Bekele, CyberNeg@rit Coordinator whose wise advices, Amharic editorials and numerous inputs are very valuable.
- Lulseged Retta for allowing his world known art works to be used for the design, look and feel of CyberEthiopia.
- All regular readers who are contributing articles and inputs in the directory.

And last but not least all participants of Warka forums in particular the Top Ten quality content contributors without whom CyberEthiopia would not have been what it is today. Their pen names (in order of number of contributions) are (አሞራው, ቆቆ, ሳክ ሃፕ, ደጉ, አብራራው, ወርቅሰው, ሀወኒ, ጣሰው ገ, ዋቆ, ማርስ, ናፍቆት, ልጁነኝ, ቃኘው)

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Annexes

Annex 1 : Ethiopic character code tables for the Unicode Standard (Ethiopic 1200 - 137F)

	120	121	122	123	124	125	126	127	128	129	12A	12B
0	ሀ 1200	ሐ 1210	ወ 1220	ሰ 1230	ቀ 1240	ቐ 1250	በ 1260	ተ 1270	ኀ 1280	ነ 1290	አ 12A0	ኰ 12B0
1	ሁ 1201	ሑ 1211	ዑ 1221	ሱ 1231	ቁ 1241	ቑ 1251	ቡ 1261	ቱ 1271	ኁ 1281	ነ 1291	ኡ 12A1	
2	ሂ 1202	ሒ 1212	ዒ 1222	ሲ 1232	ቂ 1242	ቊ 1252	ቢ 1262	ቲ 1272	ኂ 1282	ኑ 1292	ኢ 12A2	ኲ 12B2
3	ሃ 1203	ሓ 1213	ዓ 1223	ሳ 1233	ቃ 1243	ቋ 1253	ባ 1263	ታ 1273	ኃ 1283	ኔ 1293	ኣ 12A3	ኳ 12B3
4	ሄ 1204	ሔ 1214	ዓ 1224	ሴ 1234	ቄ 1244	ቋ 1254	ቤ 1264	ቲ 1274	ኄ 1284	ን 1294	ኤ 12A4	ኴ 12B4
5	ሀ 1205	ሐ 1215	ወ 1225	ሰ 1235	ቀ 1245	ቐ 1255	በ 1265	ተ 1275	ኀ 1285	ነ 1295	አ 12A5	ኰ 12B5

an excerpt from the Ethiopic character code tables for the Unicode Standard (Ethiopic 1200 - 137F)

Source: <http://www.unicode.org/charts/PDF/U1200.pdf>

Annex 2 : Some indicators for measuring access to ICT in Ethiopia

15. Information technology

	Internet				PCs	
	Hosts	Hosts per	Users	Users per	Total	Per 100
	Total	100 inhab.	(000s)	100 inhab.	(000s)	inhab.
	2002	2002	2002	2002	2002	2002
1 Angola	7	-	41	0.29	27	0.19
2 Azerbaijan	1'139	0.01	300	3.69
3 Bangladesh	2	-	204	0.15	450	0.34
4 Benin	574	0.01	50	0.74	15	0.22
5 Bhutan	1'242	0.18	10	1.45	10	1.45
6 Burkina Faso	409	-	25	0.21	19	0.16
7 Burundi	3	-	8	0.12	5	0.07
8 Cambodia	1'391	0.01	30	0.22	27	0.20
9 Cameroon	439	-	60	0.38	90	0.57
10 Central African Rep.	6	-	5	0.13	8	0.20
11 Chad	11	-	15	0.19	13	0.17
12 Comoros	12	-	3	0.42	4	0.55
13 Congo	36	-	5	0.15	13	0.39
14 Côte d'Ivoire	4'397	0.03	90	0.55	154	0.93
15 D.R. Congo	134	-	50	0.09
16 Equatorial Guinea	3	-	2	0.36	4	0.69
17 Eritrea	859	0.02	9	0.23	10	0.25
18 Ethiopia	41	-	50	0.07	100	0.15

Source : World Telecommunication Development Report 2003

16. Internet tariff
20 hours per month, August 2003

	ISP charge			Total ISP charge	Telephone usage charge	Total Internet price	
	Monthly fee	Hours included	Excess time charge			20 hours of use	As % of GNI per capita
	US\$		US\$	US\$	US\$	US\$	
1 Angola	20.00	*	-	20.00	58.81	78.81	143.3
2 Azerbaijan	-	-	11.11	11.11	97.19	108.29	183.0
3 Bangladesh	-	-	8.29	8.29	11.75	20.04	66.8
4 Benin	8.52	*	-	8.52	37.88	46.40	146.5
5 Bhutan	29.83	30	-	29.83	43.20	73.03	148.5
6 Burkina Faso	14.39	10	10.33	24.72	20.66	45.38	247.5
7 Burundi	50.00	20	-	50.00	30.94	80.94	971.3
8 Cambodia	30.00	13	15.40	45.40	11.96	57.36	245.8
9 Cameroon	-	-	28.69	28.69	22.96	51.65	110.7
10 Central African Rep.	14.35	-	103.30	117.65	57.39	175.04	807.9
11 Chad	-	*	-	-	68.87	68.87	375.6
12 Comoros	9.56	-	57.39	66.95	-	66.95	206.0
13 Congo	121.22	*	-	121.22	-	121.22	207.8
14 Côte d'Ivoire	51.65	*	-	51.65	15.50	67.15	132.1
15 D.R. Congo	14.00	20	-	14.00	60.00	74.00	986.7
16 Equatorial Guinea	103.30	*	-	103.30	-	103.30	177.1
17 Eritrea	15.33	15	-	15.33	11.46	26.79	200.9
18 Ethiopia	2.68	-	15.40	18.09	9.33	27.42	329.1
19 Gambia	11.04	*	-	11.04	16.06	27.11	116.2
20 Georgia	13.33	8	4.68	18.01	8.18	26.19	48.4

Source : World Telecommunication Development Report 2003

17. Internet

	Internet subscribers (000s) 2002	Broadband		CAGR (%) 2001-2002	International bandwidth	
		Total (000s) 2002	As % of total subscribers 2002		Total (Mbps) 2002	Bits per inhabitant 2002
1 Angola	...	-	-	-	7.0	0.5
2 Azerbaijan	12.0	-	-	-	2.1	0.3
3 Bangladesh	68.0	-	-	-	40.0	0.3
4 Benin	4.7	-	-	-	2.1	0.3
5 Bhutan	1.6	-	-	-	2.0	2.9
6 Burkina Faso	8.0	-	-	-	8.0	0.7
7 Burundi	1.4	-	-	-	4.0	0.6
8 Cambodia	6.7	0.1	0.7	...	12.0	0.9
9 Cameroon	5.5	-	-	-	9.0	0.6
10 Central African Rep.	1.3	-	-	-	0.5	0.1
11 Chad	1.8	-	-	-	0.5	0.1
12 Comoros	0.9	-	-	-	0.3	0.3
13 Congo	0.6	-	-	-	0.1	0.0
14 Côte d'Ivoire	15.2	-	-	-	11.0	0.7
15 D.R. Congo	6.0	-	-	-	10.2	0.2
16 Equatorial Guinea	0.9	-	-	-	1.0	2.0
17 Eritrea	2.4	-	-	-	2.0	0.5
18 Ethiopia	8.5	-	-	-	10.0	0.1
19 Gambia	4.0	-	-	-	2.0	1.5
20 Georgia	3.7	0.9	25.2

Source : World Telecommunication Development Report 2003

INTERNET USE IN AFRICA

Country	Population (Feb. 2004)	Internet Users (Dec. 2000)	Internet Users (Feb. 2004)	Penetration (% of pop.)
Egypt	70,832,400	450,000	1,900,000	2.7
Ethiopia	72,035,400	10,000	50,000	.1
Libya	7,526,600	10,000	125,000	1.7
Nigeria	154,491,100	200,000	420,000	.3
Somalia	11,555,300	200	200	.002
South Africa	47,556,900	2,400,000	3,100,000	6.5
Uganda	26,219,200	40,000	100,000	.4
Zimbabwe	14,712,000	50,000	500,000	3.4

Source: internetworldstats.com