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A Trilingual Creation of Terms of the Computer Language in English, French and Igbo

Felix-Emeribe, Nwanne
Department of Foreign \languages & Literatures
Faculty of Humanities
University of Port Harcourt
Port Harcourt. Nigeria
E-mail: nwanne.felix-emeribe@uniport.edu.ng

Okeogu, Chidinma Ihuaku
National Institute for Nigerian Languages
Aba, Abia State, Nigeria
E-mail: chyokeogu@yahoo.fr

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Abstract

Like humans, computers have their own language. This language is specific to them and is the main medium of communication between computer systems. A computer language consists of all the instructions to make a request to the system for processing a task and it includes various languages that are used to communicate with a computer. This language can only be made available in other languages by their being created in those languages. Term creation or Terminology cannot exist outside the cultural environment of its birth: Language. In other words, terms cannot be created outside language. We were able to collect lexical items of the computer language in English and found the French equivalents. We then created the Igbo terms of the computer language. Our creating terms in the Igbo language makes it possible for the computer language to be assimilated into the Igbo culture and be adapted and used by Igbo speakers. Nevertheless, there are challenges in the of creation terms. The thrust of this paper is to create terms in the computer language domain, explain how the terms were

created, make a comparison of some of the terms in the three languages and suggest ways of making the terms created to be available to translators and native speakers of Igbo language.

Key Words: computer language, cultural environment, term creation, terminology.

Introduction

Terminologists are concerned with ensuring the effectiveness of terms in representing concepts. In particular, they are concerned with the motivation of terms, the unity of term and concept, and definition of terms. Ideally, a term should be well motivated, that is, it should reflect the concept clearly and be self-explanatory as far as possible. *Electricity generator* is a well-motivated term because it tells us the chief functional characteristic of the object. *Eczema*, on the other hand, is a poorly motivated term because its literal meaning is 'boiling over' (from Greek *ekzein*), which, although it may have been meaningful to physicians of ancient times, does not reflect the modern etimology, and besides the literal meaning is obscure to most of its modern users. Nevertheless, we could say that *eczema*, though semantically poorly motivated, is socially positively motivated.

Our purpose in making this research is to enable the Igbo language to continually strengthen its potential to be able to be used in communication in the global village, in a world that is constantly changing. We also are of the opinion that our work will facilitate the usage of appropriate terms of the computer language by Igbo speakers. This can only be possible through the creation of terms to reflect new realities in the Igbo language. The Igbo language is not as advanced in the computer language as the English or French languages. As a result, the specialised expressions in this area are limited. That notwithstanding, the Igbo language still can be exploited to apprehend novelty in specialised areas and can be conceptualised to be assimilated it into its culture. This we intend to do by the creation of terms in the computer language from either English or French language into the Igbo language.

The Igbo language

The Igbo language is one of the three major languages in Nigeria. It is spoken in the eastern part of the country by about 25 million people in the following states: Abia, Anambra, Ebonyi, Enugu, and Imo. It is also spoken in parts of Cross River, Delta and Rivers states. The Igbo language belongs to nigéro-congolaise family of languages. (Source: http://www.oecd.org/dataoecd/21/53/38410200.pdf).

The Computer Language

Unlike the human language, the computer language is artificial. It is the main medium of communication between Computer systems. The most common are the programming languages. The computer only understands binary numbers: 0 and 1 to operate but languages are developed for different types of work on a Computer. This language consists of all the instructions to make a request to the system, for processing a task and it includes various programming languages that are used to communicate with a Computer machine. A programming language is a set of codes that is used for communicating with the machine. Machine code is equally considered as a language. It can be used for programming. Different types of languages are developed for different types of works performed by communicating with the machine. The computer language can be categorized into two basic types: the high-level language and the low-level language.

Information Technology or computerisation is one of the reasons for change in modern society. "Computers have made the creation of new technological products easier and faster" (De Castro, 2004: 65 cited by Okeogu (2012:86). It is for this reason that we want the Igbo language to be updated in the computer language to enable its users to cope with changes in the modern society.

Methodology

We made a random selection of 50 terms from the area of computer language by using the computer and the Internet. Before giving equivalent Igbo names to the English terms, we looked up the French equivalents and we looked up the meanings of these terms from the Internet and dictionaries. The Data is presented in five columns. The English terms come first, the meanings are on the second column. The French equivalents occupy the third column, the Igbo terms created come last.

Creation of Terms

Using the linguistic domain in Igbo as an example, in order to enrich the Igbo language and to accommodate new linguistic concepts, Emenanjo (1991, p. 9) proceeded by adapting English terms, thus creating Igbo terms:

English	Igbo	Method of creation
aspiration	mkponuume	translation
consonant	mgbochiume	translation
dialect	olumba	translation
idiolect	oluonye	translation
nasal	ụdaimi	translation
nasalisation	mkpọniimi	translation
synonyme	myiwere	translation
vowel	ụdaume	translation

From the above, it could be seen that Emenanjo translated the English terms into English. But term creation does not only involve translation. It equally involves morphological changes. A morphological change is the creation of a new word or combination of words. It includes borrowing, combination, derivation, and abbreviation/expansion. It usually entails semantic change. It can also involve terminologisation (change of meaning), compounding (combination of words or phrases), derivation (morphological procedure), shift of word class conversion (change of syntactic category), importation of loan-words (adoption of foreign terms or borrowing), and abbreviations (formation of an abbreviation).

Criteria for Selecting and Accepting Terms

The criteria on which the selection of terms was made was based on semantics, morphological and syntactic relationships. For a term to be accepted semantically, it has to indicate a scientific or technical notion or concept belonging to the domain under study. The form of the term can suggest its meaning

and its morphology. These criteria were considered when we selected the terms, we intended to create in the Igbo language.

Approaches to Term Creation

In our work we used the following procedures: compounding or composition, analogy, translation, phonologisation/naturalisation, hybridization and borrowing.

1. Composition

Composition involves the combining of two or more words which are already in existence to form a new one.

address book = akwụkwọ adrèesi = akwụkwọ (book) + adrèesi (address)

data = mkpụrụozi = mkpụrụ (grain) + ozi (message))

software = ngwanro = ngwa (materal) + nro (soft)

job = iheomume = ihe (something) + omume (doing)

password = okwuntughe = okwu (speech) + ntughe (opening)

2. Analogy

Terms can be created through semantic extension by analogy of form or function. The Igbo language gives names to concepts using their form or their function. We used this method in the following examples:

(a) Analogy of function

The term is created following its function as indicated by the following terms.

bandwith = mkpụrụozi nziga. (The function of the data is to send messages)

blocking access = mgbochi mbanye . (The function is to restrict access to resources)

data = mkpụrụozi (gives information)

(b) Analogy of form

The term is created according to its form

Hardware	=	ngwaike (the hard form is depicted)
keyboard	=	ugbọọtụgwa (the keybord is seen as a train carrying keys)
mouse	=	nwambe (depicts the form of a mouse)
title bar	=	ogwe isiokwu (depicts the form of a bar)

A close observation shows that the terms created in (a) (Analogy of function) and (b) (Analogy of form), can be said to highlight the cultural implication of the Igbo language (with the exception of mouse which already exists in the Igbo language). There is always a cultural dimension to denomination of

terms. In this approach, the object to be named has to be exterior to the culture of the community which is trying to give it a name in its own language and according to its culture (Edema 2008, p. 58). Just as the computer language is exterior to our culture. An example of cultural denomination in the Igbo language is the bicycle. In Igbo, the bicycle is called *ịnyịnya igwe* (iron horse). The bicycle has been seen as a means of transport resembling the horse:

> Both the horse and the bicycle are means of transport
>
> The bicycle is as fast as the horse
>
> One sits astride the bicycle and the horse
>
> On a bicycle one places his legs on the pedals as on the stirrup of the saddlery of a horse
>
> The bicycle's handle bars can be handled like the reins of the saddlery (Okeogu 2012, p. 87).

Even though the bicycle has two legs and the horse has four, this difference does not pose any problem in the perception of the bicycle as a new object then. The same goes with the terms created under analogy of form and function.

3. Borrowing

We resorted to borrowing when it became difficult to create the terms. The Igbo language borrows widely from the English language because English is associated with higher technology and industrialisation. To name concepts in a language, the language can resort to borrowing either by translating the concept as in calque or by naturalising or phonologising the concept. We equally phonologised or naturalised some of the terms borrowed while some of the borrowed terms were translated literally.

(a) By translation

Archive manager = ihe na-echekwa ọkpụ (somethng that preserves the archive)

cookie ID = kuki njirimara (cookie = kuki, ID = njirimara) (literal translation)

dotcom@ = kpọmkọm@ (dot = kpọm, com = kọm (literal translation)

dot org@ = kpọmọrg@ (literal translation

white hat = okpu ọcha (okpu = hat, ọcha = white)

4. Phonoligisation/ Naturalisation

This is a morphological process of creating terms whereby the term created imitates phonetically the term of the source language. We have the following examples:

cyber punk = sayịba pọnkụ

cybersquatter = sayịbaskwọta

dotcom@ = (kpọm)kọm@

dot org@ = (kpọm)ọrg@

The (com = kọm) and the (org = ọrg) are the ones naturalised.

ADSL modem = mọdem ADSL (modem is naturalised = mọdem)

5. Hybridisation

Terms can equally be created by hybridisation which is the creation of terms from the combination of two languages. In hybridisation, there are two types as shown below. In type A, the English language provides the affix while in type B, the Igbo language does. In our work we were faced mainly with type B. We have only one type A.

(a) Hybridisation Type A

cookie ID = ID ke kuki

(b) Hybridisation Type B

ADSL provider = ihe na-eme ka ADSL rụọ ọrụ (explanation)

FTP access = mnweta FTP

DoS attack = nkusu ke DoS

Trojan horse = ịnyịnya Troy

A look at the Igbo terms above shows that some terms are phonologised or naturalised to suit the Igbo phonetical pronunciation.

6. Terms Created

n = noun, adj = adjective, v = verb, prep = preposition, c = conjunction

English	**Explanation of term**	**French**	**Igbo**	**Analysis of term created**
access control	A security technique that can be used to regulate who or what can view or use resources in a computing environment.	contrôle d'acès	nchekwa kembanye	n + adj + n The nouns are derivations from verbs: ichekwa (to protect) and (ịbanye to enter)
ad blocker	A software product that prevents advertisements from appearing with the content the user is intentionally viewing.	bloqueur de pub	mgbochi mgbasa ozi	n + n + n
address bar	The familiar text field at the top of a web browser's	barre d'adress	àdreèsi njirichọta	n + n

address book	A location of data, usually in main memory or on a disk. You can think of computer memory as an array of storage boxes, each of which is one byte in length.	carnet d'adresses	akwụkwọ àdreèsị	n + n
ADSL modem	Asymmetric digital subscriber line (ADSL) is a type of DSL broadband communications technology used for connecting to the Internet. ADSL allows more data to be sent over existing copper telephone lines.	modem ADSL	mọdem ADSL	n + acronym
ADSL provider	ISP i.e Internet Service Provider.	fournisseur d'ADSL	ihe na-eme ka ADSL rụọ ọrụ	v + n + adj + acronym + v
alias page	An alternative address (URL) to a Confluence page or blog post.	page alias	adreèsi nnọchi	n + n
antivirus provider	A utility that searches a hard disk for viruses and removes any that are found.	fournisseur d'antivirus	ihe na-ewepụ nje	n + v + n
archive manager	Archive is a storage for long-term data retention. The archive holds data that is infrequently accessed, and may be optimized for security and compliance with data regulation policies.	gestionnaire d'archive	ihe na-echekwa ọkpụ	n + v + n
archive moderator	An individual who has the authority to archive data.	modérateur d'archives	onye nhazi ihe ọkpụ	n + n + n + n
bandwidth	The amount of data that can be transmitted in a fixed amount of time or range within a band of frequencies or wavelengths.	bande passante/ bande large	mkpụrụozi nziga	n + n + n
banner ad	A web banner or banner ad is a form of advertising on the World Wide Web delivered by an ad server.	bannière de pub	ịgbasa ozi na web	v + n + prep + n

banner advertising	A rectangular graphic display that stretches across the top or bottom of a website or down the right or left sidebar.	publicité de bannière	ọkọlọtọ mgbasa ozi/ banner mgbasa ozi	n + n + n
blocking access	A *block* or ban is a technical measure intended to restrict *access* to information or resources	accès bloquant	mgbochi mbanye	n + n
bookmark	In the context of the World Wide Web, a *bookmark* is a Uniform Resource Identifier (URI) that is stored for later retrieval in any of various storage formats.	favori/ signet	usoro nchoputa ihe nchekwa	n + n + n + n
bug hunter	A hacker who is paid to find vulnerabilities in software and websites.	chasseur de bug	nchụ akpịrị/nje/	n + n
chat group	A group created for a group of people in order to share likely ideas.	groupe de chat	otu mkpakọrịta ụka	n + n + n
cookie ID	Cookies are tiny text files that are stored on a user's browser. Most cookies contain a unique identifier called a *cookie ID.*	cookie d'identifiant	kuki ke njirimara/ kuki ke ID	n + adj + n
cyber punk	A subgenre of science fiction in a future setting that tends to focus on society as "high tech low life" featuring advanced technological and scientific achievements, such as information technology and cybernetics.	cyberpunk	sayịba pọnkụ	n + n
cybersquatter	An individual who engages in cybersqutting	cybersquatter	sayịbaskwọta	n
cybersquatting	An illegal domain name registration or use.	cybersquatting/ cybersquattage	cybaskwọtinị	n
DoS attack	In a *denial-of-service* (*DoS*) *attack*, an attacker attempts to prevent legitimate users from accessing information or services.	attaque DoS	nkusu ke DoS	n + adj + acronym

dotcom@	dotcom@	point com	kpọmcom@	n
dot org@	It is primarily used by non-profits groups or trade associations	point org	kpọm org	n + n
encrypton system	The *encryption* protects the confidentiality of digital data stored on computer *systems* or transmitted via the Internet or other computer networks.	système de chiffrement	usoro nzowe ihe na kọmputa	n + n + n + prep + n
firewall	A network security device that monitors incoming and outgoing network traffic and decides whether to allow or block specific traffic based on a defined set of security rules.	firewall /coupe-feu	mgbochi mbata ozi ọjọọ	n + n + n + n
frame relay	A standardized wide area network technology that specifies the physical and data link layers of digital telecommunications channels using a packet switching methodology.	relais de frames	mgbochiọkụ	n
FTP access	*FTP* is used to transfer files between computers on a network.	FTP accès	mnweta FTP	n + acronym
hyperlink	In computing, a *hyperlink*, or simply a link, is a reference to data that the reader can directly follow either by clicking, tapping, or hovering.	hyperlien	usoro mbanye kọmputa	n + n + n
intelligent agent	An *intelligent agent* is software that assists people and act on their behalf	agent intelligent	kọmputa mnyemaka	n + n
Internet cookie	A message given to a web browser by a web server.	cookie Internet	kuki keNtaneti	n + adj + n
mailto	A system for sending and receiving messages electronically over computer network such as e.mail	mailto	sistemu nzipu na nabata ozi na kọmputa	n + n + c + n + n + c + n (explanation)
navigation bar	A user interface element within a webpage that	barre de navigation	ịba Ntaneti	v + n

	contains links to other sections of the website			
news group	A worldwide network of news discussion group.	groupe de discussion -forum de discussion - newsgroup -forum	otu mkpakoriịta ụka ndi nta akụkọ ụwa - ebe mkpakoriịta ụka - otu ndi nta akụkọ - ebe nzukọ	n + n + n + n + n + n+ n - n + n + n - n + n + n+ n - n + n
permanent cookie	Cookie stored on a user's hard drive until it expires.	cookie permanent	kuki ọkpụ/ kuki ọkpụtọrọkpụ	- n + n
popup	A graphical user interface (GUI) display area, usually a small window that suddenly appears (pops up) in the foreground of the visual interface on the world wide web.	fenêtre publicitaire	pọpọpụ	n
script kiddy	An unskilled individual who uses scripts or programs developed by others to attack computer systems and networks and deface websites.	script kiddy private amateur	onye arụrụala Ntaneti	n + n + n
search engine spider	A crawler used by a search engine to browse and index content on the World Wide Web. Search engine spiders help keep search results up to date.	araignée de moteur de recherche	njini nchọcha idide	n + n + n
secure socket layer	A computer networking Protocol for securing connections between network applications clients and servers over an insecure network such as the Internet	protocole SSL -protocole sécurité	igwe nchekwa kọmputa	n + n + n
shopbot	An intelligent software agent that can automatically search a large number of online stores for a specific product.	robot logiciel -assistant d'achat	robot ke kọmputa	n + adj + n
startup	Starting something in motion	startup -jeune entreprise -jeune pousse	Mmalite	n

temporary cookie/ transient cookie	A cookie that crashes when the user closes the web browser	cookie temporaire	kuki na-adị nwamgbe	n + adj + n
Trojan horse	A programme that appears harmless but is in fact malicious.	cheval de Troie	ịnyịnya Troyi	n + n
uplink	A wireless connection from a local area network (LAW) to a wide area network (WAN)	liaison montante	mjikọ kemgbago	n + adj + n
white hat	A computer hacker intending to improve security (computer security).	corsaire/ mordu de l'info/ fouineur	okpu ọcha	n + n

7. Comparison of some terms of the three languages

English	**French**	**Igbo**
access control (n + n **)**	contrôle d'acès (n + prep + n)	nchekwa kembanye (n + adj + n **)**
ad blocker (n + n **)**	bloqueur de pub (n + prep + n)	mgbochi mgbasa (n + n + n **)**
address bar (n + n **)**	barre d'adress (n + prep + n)	àdreèsi njirichọta (n + n **)**
alias page (n + n **)**	page alias (n + n **)**	adreèsi nnọchi (n + n **)**
antivirus provider (n + n **)**	fournisseur d'antivirus (n + prep + n)	ihe na-ewepụ nje (n + v + n)
archive moderator (n + n **)**	modérateur d'archives (n + prep + n)	onye nhazi ihe ọkpụ (n + n + n + n)
banner advertising (n + gerund **)**	publicité de bannière (n + prep + n)	ọkọlọtọ mgbasa ozi (n + n + n)
chat group (n + n **)**	groupe de chat (n + prep + n)	otu mkpakọrịta ụka (n + n + n)
frame relay (n + n **)**	relais de frames (n + prep + n)	mgbochikụ (n)
navigation bar n + n)	barre de navigation (n + prep + n)	ịba Ntaneti (n + n **)**
news group (n + n **)**	groupe de discussion (n + prep + n)	otu mkpakorịta ụka ndi nta akụkọ ụwa n + n + n + n + n + n+ n
uplink (n)	liaison montante (n + adj **)**	njikọ kemgbago (n + n **)**

It could be observed that the terms in the three languages are mainly by composition, and that the Igbo language is more descriptive and analytic than the English or French. It contains more lexical items for the created terms. For example: English: news group (n + n) = French: groupe de discussion (n + prep + n) = Igbo: otu mkpakoṛịta ụka ndị nta akụkọ ụwa (n + n + n + n + n + n+ n).

Conclusion

Specialized concepts or terms are a means of acquiring, retrieving, creating, communicating, storing, representing and operationalising specialised knowledge. The computer language which belongs to a specialised domain fulfils these criteria. Our comparison of some of the terms in the three languages did not show much difference. The terms were created mainly by composition (n + n + n), (n + prep + n), (n + v + n) etc. Just as the Igbo language borrowed from French or English, the French language equally borrowed from English: firewall, script kiddy, and startup. The English language borrowed mail to from the French language. This proves that no language is perfect or complete in itself. Since the computer language is not known in the Igbo culture, creating terms in this area will boost the Igbo language. Our effort in creating computer language terms in the Igbo language indicates that we want the computer language to be used by the Igbo people in their own language. The terms created will also help Igbo translators in their work. We therefore call on terminologists and translators alike to arise and stand up to the challenge of creating specialized terms in Nigerian languages for it is a sure means of promotssing our languages. Igbo scholars should try to publish books on already created specialized terms to bring the language in line with the global technological advancement which we are facing. Terms created can equally be brought to the notice of Igbo speakers by publishing them as glossaries in newspapers and also make them available to Igbo news media who can make use of them as the need arises.

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