

Problems of Technical Terminology in Arabic lexicography

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100. Introduction : Lack of Technical Terminology in Arabic.

In spite of the Arabs' pride in the Arabic language as one of the oldest and richest international languages, we admit that it faces a serious problem resulting from a considerable shortage in technical and scientific terminology. A large number of our institutions of higher education still use a foreign language, English, French, or Italian as a medium of instruction for science. The shortage of technical terminology in Arabic is due to three factors :

First, for four centuries of Ottoman and Western colonization of the Arab World, Arabic was used neither as the medium of instruction nor the language of administration. Second, during those four centuries of colonization, prior to our contemporary scientific and industrial awakening which began in the 70's, Arabic

scientific institutions and scholars were not productive. Technical terms are usually coined by researchers and scientists (1). Third, the great number of scientific and technical terms that are produced every day in the industrial and postindustrial countries makes it very difficult for Arabic to catch up.

200. Coiners of Technical Terminology :

There is no single linguistic or scientific body that is in charge of coining the required technical or scientific terms in Arabic. Terminology is derived from organizations and scholars such as :

- a - Universities and Ministries of Education in the Arab World.
- b - Arabic Academies in Cairo, Baghdad, Damascus, and recently in Amman

* A paper read to the International Seminar on Lexicography organized by the British Association of Applied Linguistics at the University of Exeter, 15-17/12/1978.

(1) Abdel - Aziz Ibn Abdallah, « Problems of Arabization in Science, » *Impact of Science on Society*, Vol. 26. No. 3, (1976), 151 - 159.

c - Lexicographers who compile general or specialized monolingual or bilingual dictionaries.

d - Writers and translators who publish books and articles on various subjects.

300. How Arabic Technical Terminology is Coined :

For the last five decades, there has been a linguistic controversy between the innovators and the purists in the Arab World. The innovators advocate the practice of free borrowing from English, French, and even from colloquial dialects of Arabic to meet the ever-increasing need for scientific and technical terminology; the purists protest against the foreign derived words, and urge the use of « pure » items taken from classical Arabic. As Arabic is a « derivational » language, the purists insist that the use of Arabic items is useful in facilitating the creation of word families and thus more practical in the long run (2).

Currently, six different main techniques are used to expand Arabic technical terminology :

- (a) word borrowing
- (b) translation
- (c) coinage
- (d) giving new meanings to existing words
- (e) extending the meaning of existing words
- (f) compounding new words from existing elements from Arabic, or from it and some other one. (3)

(2) As an example, if we transliterate « radio » into Arabic, we can hardly derive any other word from it, where as if we use the root « da'a » (originally means to spread), we can derive the following words from it:
 ada'a to broadcast
 ida'a broadcasting
 mudi' announcer
 midya' radio
 and so on.

(3) Ali M. Al-Kasimi, *Linguistics and Bilingual Dictionaries* (Leiden : E. J. Brill, 1977), pp. 61-62

(4) *Ibid* P 37

400. Problems of Technical Terminology :

A scientific or technical terminology is in reality a collection of linguistic symbols that denote the concepts or objects of a certain branch of science or technology. Ideally, a terminology should be short, complete, and accurate. The main principles of any terminology are two :

(a) every distinct scientific concept or object should be represented by a distinct term, and

(b) no scientific concept or object should be represented in more than one term. (4)

However, the situation in Arabic at present is far from perfect. On the contrary, it can be described by the word « confusion » or « chaos ». A scientific book written in Iraq cannot be easily understood by Moroccan scholars in the same field. In other words, there is no standardized terminology in the Arab World. In this section of the paper, I will try to investigate and identify the various linguistic and organizational factors that contribute to this chaotic situation.

410. Linguistic problems :

Linguistic problems are either due to the Arabic language itself (intra-lingual) or to the source language, i. e. the language from which Arabic borrows or translates (inter-lingual).

411. Intra - lingual problems :

Arabic is one of the oldest living languages in the world. Nevertheless, old age has

its own problems. The following are the major problems of this sort :

(a) Diglossia

Arabic suffers from « Diglossia », a phenomenon which was defined by Ferguson as : « a relatively stable situation in which in addition to the primary dialects of the language..., there is a very divergent, highly codified (often grammatically more complex) super-imposed variety, the vehicle of a large and respected body of written literature, either of an early period or in another speech community, which is learned largely by formal education and is used for most written and formal spoken purposes but is not used by any sector of the community for ordinary conversation. » (4)

There are several socio-economic and regional dialects which exist side by side in the Arab World with literary Arabic (or sometimes called « Classical. » Arabic). Generally speaking, these dialects are mutually comprehensible to a certain extent. Literary Arabic is a unifying element linguistically and otherwise in the Arab World. To illustrate the relationship between two different Arabic dialects and literary Arabic, the following design shows the different types of common grounds among the three varieties.

DA : Dialect A

DB : Dialect B

L : Literary Arabic

4 : Common among L, DA, & DB

5 : Common between DA, & DB

6 : Common between DB, & L

7 : Common between DA, & L

Literary Arabic is the language of literature and science, and the only written variety in the Arab World. All scientific and technical terms are coined in Literary Arabic. However, sometimes when a lexicographer or a writer does not find an equivalent for a foreign technical term in literary Arabic, or he is not familiar with one that exists in it, he reverts to his mother dialect and uses a word that might not be understood by the speakers of the other Arabic dialects. (5). Colloquial words in Arabic do not enjoy the relative semantic stability that characterizes their literary counterparts. Colloquial words change their meanings from place to place and from time to time more rapidly. (6)

(b) Multiplicity of Dialects :

Although the existence of colloquial dialects in Arabic is recognized and has been investigated somewhat, no Arab, as far as I know, has seriously doubted the absolute unity of classical Arabic. In my research I have discovered that Classical Arabic itself contains a number of dialects. Although these dialects are all literary, they can be differentiated in the light of the patterned and systematic linguistic differences which can be correlated with geographical areas in the Arab World. These differences or variations in literary Arabic show themselves at all levels : in phonology, syntax, semantics, and lexicon. Differences in Phonology and lexicon can be easily noticed by even a layman. The intonation and pronunciation of a Moroccan radio announcer are consistently different from those of an Iraqi one reading the same news item. (7) Besides, the choice of vocabulary by the

(4) Charles Ferguson, « Diglossia », *Word*, 15 (1959), p. 336.

(5) Examples, the word Ghurair غرير that occurred in the Dictionary of the Arab Academy, Cairo, and the word Hirnilah هريلة included in Ghallib's dictionary.

(6) Al-Akhther Ghazal, *Méthodologie générale de l'arabisation de niveau* (Rabat : Institute of Studies and Research for Arabization 1977), in Arabic p. 27.

(7) An obvious example of differences in phonology is the different pronunciations of the phoneme /G/ in Arabic.

news editors will also be different. (8) However, these differences do not pose a serious problem to communication.

In dealing with technical terminology, we are more concerned with lexical variations in different literary Arabic dialects. When an Egyptian scientist coins a term or translates a foreign technical term he may choose an Arabic word well-known in Egypt, where an Algerian scientist might translate the same foreign term with a different word taken from Literary Arabic used in Algeria. Thus we end up with two different terms, and the possibility that an Algerian reader cannot grasp what an Egyptian scientist talks about, and so on.

(c) Richness of Arabic Vocabulary

Arabs have always considered the existence of synonyms in Arabic a sign of richness and a unique characteristic of their language. Richness of vocabulary in Arabic is partly due to the fact that Arabic has a very long tradition, and old and new names of the same thing live side by side as synonyms, and partly because Arabic has been the cultural language of a great number of peoples for centuries.

It goes without saying that in creative literary expression, richness of vocabulary is advantageous, but in scientific and technical literature it is both advantageous and disadvantageous. On the one hand, synonyms might serve as a means of precision in technical terminology when each synonym is designated to denote a slightly different concept. On the other hand, synonyms might be a handicap and lead to confusion when several synonyms are used to express the same technical concept.

Unfortunately, experience and experiment show that, for the most part, synonyms in Arabic have been used in the latter fashion.

- (8) An example for differences in Vocabulary is the word « note-book » which is « daftar », « kurras », « mufakira », « mudakira », « kurrasa » and « kunnash ».
- (9) Project of A Guide for Computers' Terminology, Compiled by ALAS, Cairo, 1977, Vol. 2, pp. 2-3.

While coordinating a trilingual dictionary of Computers and Informatics [prepared by the Arab League Organization for Public Administration based on three glossaries prepared by three organizations in Egypt, Iraq and Morocco] the writer was confronted with a number of examples of synonyms used as equivalents for the same term. For example the word « gap » was translated by the three different organizations as « furja », « fusha », and « fajwa » (9). The writer was puzzled what to choose as the three words have almost the same meaning.

412. Interlingual Problems

Some of the problems of the technical terminology in Arabic lexicography are not due to inherent problems in Arabic itself, but to the source language or languages that provide Arabic with the new scientific and technical terms. The following are the major problems of this sort :

(a) Multiplicity of Linguistic sources :

French is the second language in the Arab countries of North Africa, and English assumes this role in the Arab countries of the Middle East. Thus we have ended up with two languages as sources of our scientific and technical terms. Although these two languages use a lot of terms that include the same Greek or Latin elements, they belong to two different language families and have different ways of expression. This phenomenon has two side effects :

- i) When English and French have two different names for the same thing or concept, and these names are borrowed or translated into Arabic, Arabic will have two different words instead of one ; e.g.

English		French
Nitrogen	=	Azot
Arabic :		آزوت = نتروجين

ii) When two terms that belong to the same word family in English are translated into Arabic, they will probably form a word family in Arabic too. But if one of the two terms is translated from English and the other from French, Arabic will possibly have two terms which are conceptually related but morphologically alien. Examples from the terminology of automation and computers are :

Arabic translation

a) English :	master card	بطاقة رئيسية
French :	carte maitresse	بطاقة رئيسية
b) English :	Master clock	الساعة الرئيسية
French :	Horloge mère	(10) الساعة الام

Word families in technical terminology have a pedagogical importance : they facilitate learning of new terms and increase retention. (11) The translation of some members of a word family from the English terminology and others from the French one often leads to breaking related concepts into fortuitous pieces, and to confusion.

b) Duplication of terminology in the source language :

Even when Arab scientists or linguists adopt one source language, duplication in technical terminology cannot be completely avoided. This is due to the fact that duplication might originate in the source language itself. In the case of English, for example, American and British scientists might give two different terms to the same object or concept.

Consequently two Arabs using two dif-

ferent text-books, American and British, are bound to produce two different terms for the same object. For example, where American physicists talk about an « electronic tube », their British colleagues use « electron valve ». **Tube** and **valve** have two different equivalents in Arabic; and thus we have two terms now, namely أنبوبة الكرونية and صمام الكروني (12)

(c) Synonyms and polysemous words in the source language

Synonyms and Polysemous words in the source language are another source of trouble in the Arabic technical terminology. In the case of synonyms, the Arab translators might not be aware that the two terms are synonyms, or these two terms are translated by two different persons into Arabic. The result will be the production of two different terms for the same object or concept. For example, although both French terms « pompe à bras » and « pompe à main » mean « hand pump », they were translated into Arabic in two different ways, namely منفاخ يدوي and منفاخ بالذراع .

Polysemous words cause a certain kind of problem, especially when the source glossary does not provide definitions for the terms included. For example, the French word « porte » and the English word « port » have numerous meanings. When used in an idiomatic term without a context or definition, a hasty translator might choose the wrong sense. In Syria the French term « porte valve » was translated as حاملة الصمام (means the valve holder), and in Egypt, the equivalent English term was translated as ثغر الصمام « the valve opening or harbour. » (13) Notice that the underlined Arabic word is polysymous too.

(10) Ibid, pp. 201-202.

(11) George A. Miller, *Language and Communication* (New York : McGraw-Hill, 1963), p. 212.

(12) Al-Khatib, *A New Dictionary of Scientific and Technical Terms*, (Beirut : Librairie du Liban, 1971), p. 747.

(13) Ali M. Kamel, « The treatment of Arabization of Engineering », *Al-Lisan Al-'Arabi*, Vol. 15, Part 1 (1977), p. 135.

420. Organizational Problems :

The other type of problems of Technical terminology in Arabic lexicography can be termed as « organizational. » Under the heading three main problems can be pointed out :

- (1) Multiplicity of Coiners.
- (2) The Arabic Scientific Heritage.
- (3) Acceptability of New Terms.

421. Multiplicity of Coiners :

In the turn of the twentieth century, several regions of the Arab Nation were granted independence by their European colonizers at different times to form separate states. Each state has endeavoured to develop itself independently. As Language is a recognized means of social and educational developments many Arab States have formed Arab academies to supply their respective countries with the required Arabic terminology. These Arab academies have functioned independently and separately for decades. Just recently they decided to found a Union of Arab Academies.

Arab Academies are not the only coiners of technical terms in the Arab world. Many institutes of Arabization were established in the Arab countries to accomplish the transfer from the foreign language to Arabic as the national language (i.e. official language and medium of instruction). These institutes of Arabization have to coin a lot of terms. Unfortunately, they also assumed their responsibilities independently for a long period of time.

Arab Universities embarked on the teaching of most of the scientific and technical subjects in Arabic. They were obliged to produce their own technical terminology. As Communication is not efficient among the different Arab countries, duplication of terminology was inevitable.

Lexicographers, writers, and scientists took part in the process of supplying Arabic with new technical terms. But as publishing and distribution of books face a lot of political and technical difficulties, many of those coiners were not aware of their counterparts' work in the other Arab countries, and duplication took place in a vast quantity.

422. The Arabic Scientific Heritage :

Arabic was the International language of Sciences for centuries during the Middle Ages. A great number of technical terms were coined in it at that time. However, many lexicographers and scientists still take the trouble of coining technical terms that already exist in Arabic. This is either because they are not familiar with the Arabic scientific heritage, or because some scientific « texts » are still manuscripts that are not easily available. Even when these manuscripts are published, Arab contemporary scientists do not refer to them, but prefer to read modern books published in the foreign language in which they received their training. A humerous example is the word « pyjamas » which raised a controversy in many Arabic linguistic circles. Many translations and explanatory equivalents were suggested, and after the matter settled down to a mere transliteration of the word and it was entered into the authoritative dictionaries, it was discovered that an Arabic word already existed, namely « ma-nàma ». This word is more meaningful and precise, and it fits in the morphological patterns of Arabic.

Another result of the neglect of the Arabic scientific heritage in the contemporary movement of coining technical terminology is the phenomenon which is called by Professor Ibn Abdullah « translation from Arabic into Arabic » (14) Many terms were transliterated from English or French with traces of foreign pronun-

(14) Abdul-Aziz Ibn Abdallah, *Arabization and the Future of Arabic Language* (Cairo : ALECSO, 1975), pp. 105-119.

ciation although these terms were originally borrowed from Arabic. An example of this type of word is « sofa », which was borrowed recently from English without paying attention to its Arabic origin (Suffa).

423. The Problem of Acceptability : Usage and Coinage

Are the new scientific and technical terms accepted by the public for whom they are coined? From our experience in the Arab World, we can say a number of terms have not been used by the public for two main reasons :

First, the public is already using certain terms for those concepts and objects, and the coiners have either neglected them or were not aware of their existence. In other words, the academicians have not surveyed the terms already used by the practitioners in the field.

Second, the terms coined by academicians University professors, and writers remain in books and journals that do not reach the public, either because the public is illiterate or because these publications are not well publicized or distributed. Consequently, the public continues to use « deformed » or « corrupted » loan words.

500. Coordination of Arabization

As the Arabs are so confident and proud of their language, and as they are disappointed and dissatisfied with the continuous division of their nation into small states, almost all the problems of technical terminology in Arabic lexicography can be attributed to the lack of coordination of efforts in this field. Therefore, in 1969 the Arab League charged the Permanent Bureau of Arabization in Rabat, Morocco, with the task of coordination of specialists' accomplishments in the field of technical terminology. The name is now « The Bureau of Coordination of Arabization in the Arab World » (BCAAW), and is part of the Arab League Educational, Cultural, and Scientific Organization (ALECSO).

510. Objectives of BCAA

The Bureau of Coordination of Arabization in the Arab World aims at providing the Arabic language with complete, unified, and efficient scientific and technical terminologies.

To complete our terminologies is a two-fold task. First, we should produce terminologies in all possible fields of science and technology. Second, each terminology should be continuously updated and modified.

Unification of Arab scientific and technical terminology in the Arab World cannot be achieved by surveying all terms coined by Arab academies, Universities, linguistic organizations, lexicographers, and writers in the Arab World only, but by surveying terms that exist in our scientific heritage as well. These terms should be gathered, classified, and coordinated.

To ensure the efficiency of our terminologies we do our best to make sure that only one term is selected for each scientific or technical concept or object, that that term was coined jointly by specialists in the field as well as linguists, that it was properly defined, and that its acceptability has been tested before it is approved and proclaimed official.

520. Plan of BCAA

The Bureau of Coordination of Arabization in the Arab World has drawn a plan to complete Arabization in the Arab World. This plan consists of three stages :

1. The Arabization of General education :

Scientific and technical terms used in textbooks of primary and secondary schools were gathered from English and French books, classified in glossaries according to the subject matter, Arabic equivalents were chosen, and trilingual dictionaries (English-French-Arabic) were compiled and submitted to the Second Pari Arab Conference on Arabization held in Algiers in 1973. The Conference, which was attended by the representatives of Arab states,

Arab Academies, members of educational institutions, linguists and experts, was able to unify the scientific terminologies coordinated by the Bureau in six disciplines: mathematics, chemistry, zoology, physics, botany, and geology.

To give a greater number of experts and linguists in the Arab World the opportunity to participate in this work, the Bureau invited comments and suggestions on the terminology approved. For a year the bureau received comments and suggestions from many interested organizations, especially from the Arab Academies of Cairo, Baghdad, and Damascus. The two latter academies also took the responsibility of publishing the six dictionaries and providing them with alphabetical indexes in French.

To complete this stage (i.e. the technical terminologies used in general education), from 1973 to 1977 the Bureau worked on the coordination of the terminologies of history, geography, astronomy, philosophy, logic, public health statistics, and pure and applied mathematics. In 1977 the Third Arab Conference on Arabization was held in Libya and participants approved the glossaries coordinated by the Bureau in those fields. The Standardized terminologies had been published in the journal of the Bureau, *Al-Lisan Al-Arabi* (« The Arabic Tongue »), in order to invite comments and suggestions before being published in separate trilingual dictionaries by the Arab Academies of Baghdad and Damascus.

2. The Arabization of Vocational Education :

At present, the Bureau is undertaking the task of coordinating the technical terminology used in the technical and vocational schools in the Arab World. Seven disciplines have been chosen: mechanics, printing, architecture, electronics, carpentry, commerce and accountancy, and the technology of production. Their terminologies will be compiled in seven glossaries to be submitted to the fourth Pan-Arab Conference on Arabization, to be held in 1980 in one of the Arab Capitals to be chosen later.

It might be useful to describe the actual procedure or the steps followed now by the Bureau in compiling the terminology of each of these fields. The main steps are as follows :

- (a) English and French Scholastic text books used in each subject in the Arab World and abroad are gathered.
- (b) The text-books are surveyed to pick up the technical terms of these fields. Some teachers of these subjects take part in this part of the work.
- (c) Two main glossaries, one in English, the other in French, are compiled, and a small seminar of experts and specialized teachers will be held to ensure the relevance of the entries in the glossaries to the discipline.
- (d) Arabic dictionaries, glossaries, text-books, papers, and articles, which are related to the field under investigation are gathered to search in them for Arabic equivalents of the terms of the glossaries mentioned in (c).
- (e) A trilingual glossary (English-French-Arabic) is compiled. Those English and French terms that have no equivalents in Arabic will be given some suggested by the experts in the Bureau.
- (f) Copies of the glossary are sent to the correspondents of the Bureau in the Arab World and abroad, the committees of Arabization in the Ministries of Education, Arab Universities, and to the Arab academies of Baghdad, Cairo, and Damascus. Their comments and suggestions are invited
- (g) The glossaries will appear in the journal of the Bureau, which has a circulation of 7000 copies distributed freely all over the Arab World, to invite more comments and suggestions.
- (h) Suggestions and comments are coordinated and incorporated in the glossaries before they are submitted to the Fourth Pan-Arab Conference of Arabization for approval.

3. The Arabization of Higher Education

From 1980 to 1983, the Bureau will be working on the coordination of the terminology of Scientific and technical subjects of Higher Education in the Arab World. The product in the form of trilingual glossaries will be submitted to the Fifth Pan-Arab Conference on Arabization which will be held in 1983 in one of the Arab capitals.

4. Polytechnic Dictionary :

After the Fifth Arab Conference on Arabization in 1983, the Bureau will assume the responsibility of compiling the polytechnic or the general dictionary of scientific and technical terminology which we hope to complete in 1986.

Of course, the process of updating and revising of our terminologies in the light of developments in science and technology should be continuous.

Scholastic Stage	Time Schedule for Arabization (1969 - 1986)		Subjects
	Year	Conference	
	1969	First, Rabat	
General Education (Primary and Secondary)	1973	Second, Algiers	pure and applied Mathematics, Chemistry Physics, Botany, Geology, Zoology.
	1977	Third, Libya	History, Geography, Philosophy, Public health, Statistics, Astronomy.
Vocational Education	1980	Fourth,	Mechanics, printing, Architecture, Electronics Carpentry, Technology of Production, Commerce and Accountancy.
Higher Education	1983	Fifth,	All Subjects
Polytechnic Dictionary	1986	Sixth,	All Subjects

600. Computer-Assisted Lexicography

The Bureau has so far produced more than 80 trilingual specialized dictionaries in all fields of science and technology. When our European and American visitors learn that all the lexicographical processes are undertaken manually they show their surprise. Processes such as searching for equivalents, matching those equivalents with English and French terms, put-

ting the glossary in an alphabetical order, preparing alphabetical indexes in the other two languages, labeling the technical terms according to their subject, source, and degree of reliability, etc. etc. consume a lot of time, require a great deal of effort, and put a huge demand on our employees. Therefore, the Bureau has already made arrangements with the Language Services Department of Siemens and other organizations to use their computer facilities, and

install a terminal in our headquarter to give us access to their Terminological data banks. Another advantage of using the computer in our work is the hope of increasing the number of the foreign languages used in our dictionaries. German, Russian, and possibly other lan-

guages might be at the disposal of the users of our dictionaries.

To sum up, lexicographers in the Arab World are charged now with the task of the standardization of technical terminology and language planning ; a task which saddle them with great responsibilities.

