

Computerization and Standardization of Arabic Scientific Terminology

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Abstract

Translation of scientific term has gained nowadays a great importance in the age of scientific expansion and the rapid growth of inventions appearing every day. Scientific terminologies play an eminent role in the development and progress of modern technologies which appear every day and attention given to the terminological activities will lead to a high degree of precision while transferring knowledge and technologies between various cultures. The absence of the existence of any Arab grid institution for the standardization and computerization of Arabic terminology in the light of the new developments which goes along with the general theory of terminology, the multiplicity of institutions involve in coining terms has led to a serious communication problem at both the national and international levels, which led to the waste of time and efforts, throughout the Arab world. Arabic manuscripts are scattered all over the world and there should be a real computerized effort to gather this significant heritage to form a database and thesaurus to the Arabic etymological lexicon. The contribution of modern terminology theory appeared recently in this regard will be great value to facilitate the work of researchers in this field. The future to our nation is promising to harvest the fruits of hi- tech and I- tech to restore the national identity and the renaissance of the golden age during the era of Bait Al Hikmah that gave hand to industrial revolution in Europe. The researcher concludes that an Arab Term Net should be established to gather the efforts of terminologists, subject field specialists and translators. In addition to the creation of etymological dictionary including all Arab scientific terminologies, defining them to facilitate spreading them throughout the Arab world.

Keywords: Standardization, Scientific Translation, Terminology.

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Introduction

With the foundations of a general theory of terminology (G.T.T) and in the light of new technological devices which have appeared recently in the field, the structure of contemporary scientific terminology in Arabic should be reviewed and revised to establish an "Arab School" for terminology base on standardization and computerization at both the national and international levels.

Terminology is a trans-disciplinary subject which concerns all subject fields and activities of human life in which communication through language for special purposes plays an important role. During recent decades, terminology science, terminology work, and terminology documentation have made greater progress. They are at present in rapid development. A growing number of institution, universities and other units of higher education are showing interest in the subject matter of terminology at both national and international levels.

I have chosen to make it my commitments and responsibilities to help in disseminating information about terminology and thus to encourage researchers to enhance the terminological work responding to the studies in the field, recognizing the growing importance of terminology for the development of science, technology, and humanities not to forget also its particular importance for translation, information, and documentation activities bearing in mind our urgent need to standardize our terminology. Consequently, this will encourage me to devote my time and energy to write this research paper and to go ahead in my mission in order to establish a new look and pilot project to facilitate our urgent need to transfer knowledge from other languages and cultures.

Statement of the problem

This research paper concentrates on the translation contemporary scientific terminology in Arabic as it represents the essence for any terminological project or any future plans for the development of Arabic and language planning.

The fact that we do not have any policy for language planning or any strategy for the standardization of our terminologies has led to many serious communication problems.

The absence of Arabic methodological school for terminology based on standardization and computerization has widened the gap between various Arab countries. Arab translators often complain of inconsistency in their translations due the lack of unification and the multiplicity of institutions which assign terms.

The fact that we do not have any rigid authority for the unification, creation and standardization of terms recognized by all Arab partners has complicated the issue of regulation and coordination to achieve optimal results in the course of preparation, documentation and dissemination.

Increased scientific activity, especially in the natural sciences and in the technology, has made more precise technical communication necessary unless language is perfected, there can be no scientific or technological progress (Felber 1986). Ambiguous technical expressions in Arabic create misunderstanding of scientific knowledge. Polysemy, synonymy and multi-word lexical expressions have burdened the language as scientific terms require a high degree of precision and accuracy. Terminological precision is based on the concept, not on the lexical symbol; and that is why accuracy and precision are prerequisites for term formation.

Precise communication in one's native tongue and in a foreign language depends not on the precision of the language but on the precision of conceptual content of the subject treated. (Marcus, 1980, p.3).

Advancement and progress in science and technology increased rapidly towards the end of the 19th century creating many thousands of technical concepts and terms and thus the need was felt to regulate principles for the unification of terms. In 1980, for example, when the International Electro Technical Commission (IEC) began work, there were 15 different units for "electrical resistance" and eight for "electromotive force" in use in various countries (Felber 1986, p.3). It was not until the Second World War, when associations for standardization emerged playing an eminent role in regulating technical language.

Significance of the study

The significance of this study is due to the following factors:

1. The lack of any policy or strategy that governs the Arabic efforts and directs them towards unification which has led to the waste of time, efforts and money.
2. The absence of an institution recognized by various Arab countries for the standardization of Arabic terms based on consensus of all partners had led to the confusion of the Arabic terms and widened the gap of clear communication especially when scientific and technical terms are in question.
3. The adoption of various methodologies in the application of terminological principles neglecting the fact that these methodologies must be updated.
4. The imbalance in the attention given to certain subject fields at the expense of others, noticeably that the number of lexicons in medicine, for example, is enormous whereas the number of lexicons in linguistics or mathematics is relatively low since the decision is based on personal initiatives and commercial benefits in general.
5. The literature about the subject is scattered all over the Arab world and there is not any specialized library that takes care of gathering the material to facilitate the work of researchers to provide easy access to any literature.
6. The rapid addition of terms to the list of the international lexicon every day.
7. Specialists very often are complaining of communication problems since the circulation of standard terms is still limited. The standard which must be based on consensus or an authority to disseminate, prefer or discard any term to achieve

optimal results.

8. The avoidance of ambiguity, synonymy and polysemy is a prerequisite for new technological terms; however, this has not been the case in Arabic. Efforts in this field should guarantee the communication between specialists and the transfer of knowledge for education.
9. Communication is only possible if a permanent term is assigned to a concept or vice versa in an unambiguous way. Technical communication is a matter of clarity rather than a variety. Uncontrolled development of terminology science leads to inconsistency and contradiction and thus regulatory measures in terminology have become necessary. It has become evident that to increase the efficiency of the translation process requires the assistance of computers and new technological devices which help in recording, disseminating, as well as continual updating of information by national and international organizations.

Methodology of Study

This study will explore and analyze a randomly sample of scientific terms and their equivalences in Arabic, throughout a critical and analytical study. The various strategies and characteristics of Arabic terminology will be discussed to find out their main intrinsic and extrinsic characteristics. The following gives a clue of such strategies.

Arabic Equivalences	English Term
حساب ,حاسب ,رتاب ,نظام ,فاكور ,حاسب الكترونى ,دماغ الكرونى ,عقل الكترونى ,حاسب آلى	Computer
علم الالسن ,الالسنه ,اللسانيات ,اللغويات ,علم اللسنه.	Linguistics
مقياس حرارة ,ميزان حرارة ,محرارز	Thermometer
تحليل الخطاب ,تحليل النص ,تحليل الكلام	Discourse Analytics
طائرة عمودية ,طائرة سمتية ,طوافة حوامه.	Helicopter

Terminology is the tool of research; it is the means of communication between scientists. No scientific progress can be imagined without lexical patterns, that explains it and its content, as sciences in continuous progress so there should be a linguistic parallel progress to this scientific progress to go along with.

Standardization is the application of theoretical rules and principles scientifically proved, agreed upon by specialists in the field, carefully elected to apply its principles, as terminology of certain rules, in order to be applicable to end up with term to meet one concept which represents the ideal method.

Standardization of Arabic terminology could be between the lexical items in the same language and the lexical items of other languages; here we talk about standardization at both the national or international levels.

Arabs and Islamic world were pioneers in establishing the fundamental bases for standardization of Arabic terminology which has led to the creation of first dictionaries

ever known in the history of mankind. These dictionaries are still evident and valid even to modern times.

Ideal terminology should acquire certain qualities such as; precision, clarity, easy spelling derivation, dissemination, linguistic knowledge, language and the history of the language and its heritage in addition to some other qualities. These qualities can benefit from linguistic heritage, thesaurus; however, standardization and computerization of Arabic terminology represents urgent need for contemporary development and progress of scientific research as it is the tool for scientific communication.

Standardization terminology should be approved from an authorized committee; it should be carefully identified with the best possible definition from a terminology committee, taking into consideration the users view and their suggestions throughout the committee. This terminology should take place through regular intervals to cope up with the recent developments and any scientific progress such as computer advancement, documentation, terminography, recordings and microfiche.

The Arab tern net is an urgent need for the Arab world to facilitate easy communication within the Arab world, and the rest of the world by having a wireless Internet communication that makes the work of no cost and of higher speed.

Standardization of terminology to have one term for each concept is an important matter in the absences of an authorized committee in the Arab world. Scholars are waiting for solutions to their terminological problems while writing their research papers.

The problem of standardization is not local for Jordanians or the Arab world; it exceeds the national level to the international one. It represents a national problem in the Arab world, especially when dealing with other foreign culture. Solutions should take place as soon as possible without adopting any sentiments instead of scientific logic.

Scientific terminology has its political, economic, cultural connotations inside the Arab world, in addition to the social one which may lead to the language split between various communities inside the Arab world.

Standardization of terminology in the Arab world has its special importance, it is an attempt to restore the national identity which imperialism attempts to steal from the Arab world which means the avoidance of basic awareness to the process of standardization and computerization to enhance the unification of Arabic terminology and to get rid of the role drown to Arabs to act as consumers rather the producer.

Strategies of Term Creation in Arabic:

Arabic Terminology in History

Arabs were active contributors to human civilization, their finger-print can be traced in all branches of human knowledge. During the first Arab renaissance, they successfully translated huge number of books from the previous leading powers of the time i.e., the Greeks and the Persians. They can comprehend these sciences, refine them and gave them as present to the world. The cultural heritage can be an everlasting source of inspiration to every Arab nowadays to continue the journey of his ancestors and to face the challenges of modern world civilization.

This study is intended to shed some light on the historical background of modern Arabic terminology to investigate the efficiency of these scientific terms in meeting the Arab needs by improving their scientific and terminological approach. This results in establishing a better understanding of the general theory of terminology attempt to encourage its application to Arabic.

Arabic never had in its history any school of terminology in the modern sense of this term despite the fact that the basic elements of terminology are deeply rooted in the history of Arabic, and can be traced back to the pre-Islamic era.

Many lexical items of foreign origins found their way to Arabic as a result of the of the interaction between various attributes and the existing powers of the time such as the Byzantines, Latins, Greeks, Aramaic's.....etc.

The following examples illustrate this point of view (ehdi Ali, 1987; Fahmi, 1961):

The Foreign World	The Arabic form
From Latin: nauge	an-nawa:jid
Greek: phylosophus	falsafah
Persian: dostur	dust:r
Hebrew: guhinnam	jahannam
Syriac: gabarota	jabarut

Prior to the advent of Islam, as well as after it, have been various types of contact between Arabs and nations. History tells us that the people of Arabia, especially the western region of it, known by the name of al- Hijaz, were active traders, who, as a natural result of frequent journeys outside their homeland, developed commercial, economic, and cultural, as well as family, ties with the people with whom they came into contact. Present day Arabic is generally said to trace its origin mainly to the language spoken in this area (Mehdi Ali 1987, p.89).

Instances of foreign vocabularies introduced to Arabic can be recorded in the poems written by pre-Islamic such as Tarafah Ibn al Abd, Imru' Al Qays and Adiyy bin Zayd. The fact that the holy Qura'a:n contains a number of lexical items caused a heated controversy among Muslims who were mainly divided into two groups:

1-Those who accepted the existence of foreign vocabularies in the Holy Qur'a:n – Sa'id Ibn Jubayr was one of the supporters of this view.

2-Those who denied the existence of foreign vocabularies in the Holy Qur'a:n depending on the Qur'a:nic verse: ?inna: anzalna:hu qur'a:nan 'arabiyayyan (su:rat Yusuf verse 2) emphasizing that all that is written in the Holy Book is purely Arabic.

As the Islamic state has expanded its sphere of influence to include a very wide geographical area, the need was left for term creation. Arabic thus escorted at this stage to various methods of lexical expansion such as derivations, metaphors, compounds, blends and Arabicization.

Arabic Word Structure

One of the most important convictions of the modern linguist is that every human language is a system, which involves a great degree of complexity, far greater than we normally realize. It has also been established that what applies in the case of one language may not necessarily apply in another. In view of these facts and due to the nature of our study), (in which various aspects of linguistically structure characteristic of more than one language are frequently discussed and compared) we have found it necessary to supply the reader with a clear ides of the fundamental principles of Arabic word structure. Another important purpose to be served by the present discussion consists of clearly defined concepts in accordance with which facts and claims can safely and confidently be stated.

However, we do not propose to discuss here all the possible issues that may be included under the heading Arabic Word Structure. In the present chapter priority has been given to those fact and pieces of information which are necessary for paving the way towards clearer understanding of the problems discussed, as well as a precise and consistent account of their analysis.

Growth of Arabic Vocabulary: Historical Background

When one studies the history of the development of Arabic and considers the rapidity of its expansion, its responsibility to change (i.e. such change as has, for instance been undergone by English over its history), and yet at the same time its qualitative capacity to adapt, and particularly its evolution from a language mainly of poetry (prior to the advent of Islam) into a successful medium of scientific expression (in pose-Islamic society), one is bound to state Arabic in this respect may well represent a unique case among the languages of the world. The state of affairs has been such that one writer (Chejne, 1969) described this rise of Arabic as one of the miracles of history. Another has referred to it as "the true wonder of Arab expansion" (Inizan, 1999). However, what interest us at this stage is to point out the fact that the changes in the religious, social and cultural life of the hitherto mainly nomadic society constituted a crucial test of the powers and potential of the language, a test which Arabic clearly proved to be highly qualified to stand.

Thus, with the advent of Islam, the language which has been primarily poetic and whose vocabulary had more or less than confined to the relatively narrow world of the nomadic society, (26) was now confronted with the huge task of accommodating itself and adapting its vocabulary to an increasing large number of new concepts and ideas pertaining to a wide variety of social and intellectual discipline. That Arabic was quite prepared to achieve that task is a merit with which it has already been credited by many scholars of our age. Hassnawi, 2003 for instance, remarks: "all Arabs were an acute and observant people, and for all natural objects which fell under their notice they had appropriate and finally differentiated words".

It goes without saying that the Qur'an, with the new concepts it gave birth to, the new expressions it introduced, the new values it established, was the most important factor behind the development of Arabic as well as the newly born society that was speaking it. As far as the language is concerned, we thus find that many already existing words (or at least roots) were now assigned new technical senses.

Well before the end of the first Islamic century, the Arab armies had already expanded the area of their empire to include the major centers of civilization and become the greatest of the time, under the second Caliph, Umar (634-644). This of course meant new challenges of Arabic, the language of the conquerors, as it had to compete with the languages of the conquered lands which were well established and backed by cultural heritage, such as Greek in Egypt and Syria and Persian in western provinces. New expressions and technical terms were given rise by the new circumstances facing the language in the fields of administration, legislation, politics etc. in the process of creating such terms the general tendency during this stage seems to have been to resort as far as possible to native-based methods, especially derivation, semantic extension of existing words and reviving pre-Islamic vocabulary though instances of foreign borrowings are not difficult to find.

In addition to these developments, it is also possible to distinguish many other significant factors involved in the growth of Arabic vocabulary. These include:

- The Arabs' love for their language and their enthusiasm to excel in the studies related to it continued unabated despite the radical changes that had taken place in their life and development.
- The Abbasid period can be said to have witnessed the most favorable circumstances for the growth of scientific and technical terminology in Arabic in its early history.
- Far beyond the borders of its land, Arabic was also enjoying a very prosperous period. In Spain, for instance, no sooner had the Arab conquerors settled than they established their mother tongue as the official language, which documents, sermons, coins, etc. were issued.

The reader will now have realized that the process of growth and expansion experienced by Arabic in its history in its early stages was enhanced, besides its internal qualitative capacities, by what may be described as favorable external factors and circumstances such as its being the language of the Holy Qur'an and the widely spreading religion, the

extensive social, cultural and particularly scientific contact between the Arabs and other nations, the great interest taken by early scholars in studies involving its various aspects, etc.

Lexical adaptation in the first renaissance

It has been suggested above that Arabic has the capacity to adapt itself to the needs and circumstances facing it. The present investigation seeks to illustrate the preceding statement with examples of scientific and technical words used in the period following the advent of Islam until the thirteen century.

As far as the process of creating new vocabulary is concerned, the distinction between native and non-native sciences may be said to derive some significance from the fact that, generally speaking, in the case of native sciences the process in question has not constituted a real challenge to Arabic. In the case of foreign sciences, on the other hand, the situation cannot be said to have been the same.

The Arabic came into contact with these sciences mainly through translation is indicative of the fact that it was somehow subjected to the influence of a foreign language or languages, at least as far as the lexicon is concerned. And despite the hard efforts to keep Arabic pure, traces of this influence are still alive; suffice it to say that the names Arabic uses for some of these sciences are themselves non-native, e.g. falsafah, handasah, musi:,qa, etc.

Characteristics of Contemporary Scientific

Arabic represents one of the five predominant significant carriers of civilization to mankind. The four others being classical Chinese, Sanskrit, Greek and Latin (Mehdi Ali 1987, p.26). Since languages are God's gift to human beings, so is to Arabic to Arabs in particular, and to Muslims in general; in addition, a great number of languages have copied so many words and structures out of it, e.g. in English we see Arabic vocabularies such as:

alkuhu:l	"alcohol"
ambar	"amber"

After all, Arabic is one of the six official languages adopted by the United Nations (the other five languages are: English, Chinese, French, Spanish and Russian).

The flexibility of Arabic structures enables Arabs to meet their scientific and technical needs. When they feel the need for term creation, they will find that their language is reliable through various methods of term creation such as derivation, metaphor, compound, borrowing and Arabicisation.

The structure of contemporary scientific terminology in Arabic faces many challenges nowadays due to the rapid growth of created terms as well as the advancement of science

technology. The danger of this challenge is present in the increasing number of individuals who believe that their language is no longer able to cope with foreign lexical terms added to the international lexicon almost every day. Despite the continuous efforts and attempts made by the four Arab academies of Arabic in addition to the greater number of institutions, universities and individual attempts of linguists and translators involved in various terminological activities, it is evident that all these efforts and attempts lack unification, organization and coordination.

Arab translators now are under continuous pressure to find equivalents for new terms. Thus, they face a dilemma of how to structure our new scientific terms even in the very cases when they are lucky to find a term appeals to their personal taste.

A question arises ‘Are they allowed or authorized to legislate for the language?’ The fear of adding any (poison) to the (honey) of our language is always present. Some translators dare to do so whereas the Arabicized form (the adoption of the foreign phonological pattern). Many attempts were made to remedy this dilemma through the contributions of the academies, individuals interested in the field and other institutions interested in translation. However, none of these are capable of solving the problem by itself.

The Main Characteristics of Contemporary Scientific Terminology in Arabic

What are these characteristics? How do we structure our terminologies?

This study attempts to investigate the main characteristics of contemporary scientific terminology in Arabic. Throughout a critical analysis of terms as they appear in modern technical dictionaries and various publications by various Arab Academies, opponents of Arabicisation often claim that the womb of Arabic cannot hold the rapid growth of newly born scientific terms and thus Arabic is not capable of giving birth to newly generated terms.

Term formation

The following principles should be observed when forming terms:

1. Any ambiguity of terms should be avoided.
 2. Any synonymy of terms should be excluded.
 3. Established usage should not be changed without logical reasons.
 4. The constituents terms should represent the most important characteristics of the concept.
 5. Terms should permit outer forms that make it possible to form derivations.
- (Felber, 1984)

Progress in science and technology is due the development of concepts and their linguistic representations, which play an eminent role a vehicle for transferring knowledge among various cultures. In spite of the aesthetic values our scientific terms used to enjoy at earlier stages, a long list of negative characteristics began to emerge in modern times. These characteristics can be divided into two main categories:

General Extrinsic

Characteristics which concern external factors that affect term creation. That include:

1. Multiplicity of institutions that assign terms
2. Imbalance in quantity
3. Methodological variations
4. Lack of coordination
5. Technological and chronological shortcomings
6. Regionalism
7. Confusion

Specific characteristics (extrinsic) which include:

1. Simplicity
2. Accuracy
3. Precision
4. Orthography
5. Capacity for derivation
6. Frequency of occurrence
7. Ambiguity
8. Polysemy
9. Synonymy

Critical Analysis

The intrusion of foreign lexical items into Arabic has become a widely spread phenomenon in the structure of our contemporary terms which has led to serious communication problems between authors and their readers. Some of them have the tendency to insert the Latin suffixes to the Arab word, which distorts the shape of and the beautiful of native vocabularies. Thus, we have seen term like: sawti:m, fikrolo:gia, kahrabu:n, as equivalences to phoneme, ideology and electron. Here foreign terms are preferable to be used rather than to adopt terms half of which is foreign.

Men of letters often complain that scientific terms are "dry" and do not appeal to literary taste. Scientists do not deny this fact; however, they do not reject their words on this basis, as they are not concerned so much with the shape of beauty or beauty of the word rather than its efficiency in conveying the message. Arab native scientific vocabularies are usually characterized by shortness, pleasantness and other aesthetic values. Unlike ordinary words, scientific terms do not normally change their meaning or acquire new associations in the course of time, for once they do so, and they lose their distinction as precise and unambiguous labels.

The Standardization of Terminology at both National and International Levels

The fact that we do not have any policy for language planning or any strategy for the standardization of our terminologies has led to many serious communication problems.

The absence of an Arabic methodological school for terminology based on standardization and computerization has widened the gap between various Arab countries. Arab translators often complain of the inconsistency in their translations due to the lack of unification and the multiplicity of institutions, which assign terms.

The fact that we do not have any rigid authority for the unification, creation and standardization of terms- recognized by all Arab partners- has complicated the issue of regulation and coordination to achieve optimal results during preparation, documentation and dissemination.

"Increased scientific activity, especially in the natural sciences and in the technology, has made more precise technical communication necessary unless language is perfected, there can be no scientific or technological progress" (Felber 1986, p.1). Ambiguous technical expressions in Arabic create misunderstanding of scientific knowledge. Polysemy, synonymy and multi-word lexical expressions have burdened the language as scientific terms require a high degree of precision and accuracy. Terminological precision is based on the concept, not on the lexical symbol; and that is why accuracy and precision are prerequisites for term formation.

"Precise communication in one's native tongue and in a foreign language depends not on the precision of the language but on the precision of conceptual content of the subject treated. (MacLeod, et al., 2016).

Definition of Standardization

Helmut Felber defines standardization as the "activity of establishing, for repetitive application, solutions to actual or potential problems, aimed at the achievement of the optimum degree of order in a given context" (Felber 1985, p.5). it facilitates technological cooperation and prevents any barriers to transfer of knowledge among languages.

Techniques of Standardization

Standardization of terminology can be done by:

- Delineating neighboring concepts in a system of concepts, i.e. by precisely defining these concepts
- Establishing a system of concepts
- Evaluating and selecting terms which are then assigned to the concepts
- Evaluating and selecting term elements (morphemes) to be used in the creation of new terms.

Methods of Standardizing Terminologies

In order to standardize terminology in a particular field, an inventory of terms available in the field must first be made, that is, the terms of the field in question have to be collected and recorded. At the same time, terms assigned to general concepts of science and technology that might be useful should be included. Afterwards the collection terms are examined with respect to their compliance with terminology principles. It is useful to look for existing classifications that could be used, at least in adopted form, for the classification of concepts.

Standardization of Arabic Terminology at the National Level National Level

The rapid growth of newly born terms added to the international lexicon everyday has made the task of assigning Arabic equivalences a difficult one. It is true that we have ten institutions in the interest of Arabicization scattered all over the Arab world. Among these there are four Arab academies in Cairo, Amman, Damascus and Baghdad in addition to the P.B.A (Permanent Bureau of Coordination of Arabicization). However, the lack of coordination among institutions has widened the gap between various Arab partners all over the world. Consequently, there is serious deterioration of language, economy and the language is burdened with a long list of polysymous terms, despite the fact that these institutions were supposed to serve the single purpose, which is the Arabic language. Thus, we have seen 23 different terms for linguistics and 12 terms for computer, due to the fact that Arabs are not consistent in translating these terms. Translators who translate from French in the western part of the Arab world end up with terms like rata:b, naddaa:m, fa:ku:ra for the computer and translator who translate from English in the eastern part of the Arab world end up with terms like hasib and hasub, not to mention here the influence of other languages such as German, Italian.....etc.

The unwise importing of terms corrupts the language and distorts it. It is difficult to overcome these problems and a solution is not easy to find. However, through real intensification of efforts supported by good management, division of labor and computerization, valid results can be achieved.

Standardizing of Terms of at International Level

The choice of standard terms should be as accurate and precise as possible. Otherwise, it may lead to a language split. An Arab Tern Net, in addition to real intensive efforts for unification, is a possible means for solving the problem of 18 thousand new terms added to the list every year in addition to 250 thousand terms considered to be the Arabic back log from earlier stages.

Problems and Solutions

The structure of contemporary terms of Arabic faces various types of problems. Scientific backwardness, serious communication problems and inconsistency in the methodologies used for the term creation are presented. Due to the lack of any applicable police or

strategy, in this regard, these problems cannot be solved through individuals unless they are organized in an institution that controls, divides labor and passes decisions.

We will try to underline these problems in search for possible solutions. We do not want to commit the same mistake or to legislate for the language, as we are not authorized to do so. This will require teamwork inside "linguistic parliament" where different representatives, such as terminologists, subject field specialists and researchers, work together to achieve the aims of this parliament.

Multiplicity of Institution Involved in Term Creation

It is evident that having a great number of institutions such as the four Arab academies in addition to universities, translation departments and individual lexicographers involved in the process of term creation, leads to confusion, inconsistency and polysemy terms, which may result in language split.

The rapid growth of scientific terms added to the list of international lexicon everyday makes the task of these institutions can solve the problem separately. It is worth mentioning that the period of scientific stagnation that lasted for four centuries during the "Ottoman Empire" complicated this issue and prevented Arabs from grasping new developments in science and technology.

The Linguistic Problem

Arabic is a language deeply rooted in history. Its linguistic heritage is enormous and the number of its vocabulary exceeds the number of any other languages. Polysemy and synonymy are predominant features in Arabic, which represent inappreciable merit to literary writers. However, this is not the case when science and technology accurate and should avoid polysemy. Other problems can be traced to the source language. An Arab translator of an American book translates "electronic tube" into ʔunbu:bahkahruba:ʔiyyah whereas the equivalent English term "electronic valve" is translated sammam ʔaliktroni. Actually the two terms are identical.

Imbalance in Quantity

Certain fields attract the attention of lexicographers more than others. The decision here is based usually on personal initiatives rather than to meet the scientific needs, in addition to the commercial purposes, which may direct these efforts far away from the scientific approach. Such a problem could not be solved unless a committee is organized to evaluate such works and to approve distinguished works to be selected for publication.

Incoordination

Arabs efforts in terminology are scattered all over Arab world without any kind of coordination. Nobody seems to benefit from or continue others' efforts. No university seems to know what is going on in other universities. Efforts in this regards are isolated

and can hardly be contained in any library specialized in collecting data for terminological work.

There is no other solution but to gather all these efforts in one authorized institution supported by high chronological devices to facilitate instance communication among various partners in the Arab world. Such a situation should be capable of the storage and retrieval of scientific terms and other relevant data.

The Use of Ancient Arabic Lexicon

The Arabic ancient lexicon includes a huge number of scientific and literary terms. There is lack of access in handling such terms as they are scattered in manuscripts all over the worlds. In addition, there is a tendency among scholars to investigate and research modern writings rather than being bothered in dealing with "obsolete" terms, thus original terms have become obsolete. The examples are many here new Arabicized forms have these "equivalents" in Arabic heritage. For example, the term "pyjamas" has a much better Arabic term, which is mana:ma, and the term "helicopter" has the term samtiyyahor ta:ʔirah'amu:diyyah. To the Arab native speaker, such terms are acceptable to convey the message, "the conceptual content".

Suggestions and Recommendations

The structure of contemporary scientific terminology in Arabic faces many challenges and crises created by the fact that terminological work suffers from confusion, multiplicity of institutions that assigns terms, in addition to incoordination which scatters the Arab efforts and leads to the waste of time, efforts and money.

Thus, our scientific terms do not meet the urgent needs of our researchers and students of science and technology. There is an absence of any policy or strategy widely accepted by different Arab partners for standardization, adoption of methodologies and unification of scientific terms. Consequently, Arab translation efforts are few and textbooks at higher education are not available. Foreign languages are still used in various Arab universities.

Many attempts were made for the formation of principles of term creation; however, these efforts are defendant on personal initiatives forgetting the fact that such great work should be conducted through a unique institution supported by a number of such institutions to cover all sectors of Arab work. Such an institution might be called "The linguistic Parliament" where representatives from various fields are present. Linguists, subject field specialists, terminologists, documentarists, computer specialists in addition to term users should be consulted in the course of assigning new terms. The dissemination of agreed-upon terms, through an effective means of communication, should guarantee instant and easy access to the terms assigned.

To achieve optimal results, the following suggestion and recommendations could be of great value:

Arab Term Net - the establishment of an "Arab Term Net" is strongly recommended. It should be based on standardization and computerization. Following the example of the European Economic Community (EEC), which has a computerized system that enables instant and easy access among various partners to terminological, bibliographical or factographical data. Any interested institution or individual can be a subscriber to this system through terminals. This in turn, enables the retrieval or storage of data to facilitate the work of scholars, researchers or translators interested in the field.

Multi-functional knowledge data banks are more economical; however, to take any decision, a feasibility study should be conducted to decide which proper system is preferable. The experience of INFOTERM in this regard, could be of great help.

A National plan project should be adopted in order to establish a clear well-defined policy to modernize the structure of our contemporary scientific terminologies. Language planning methodologies, within an Arab framework, should be unified through the participation of all institutions, academies and experts in terminology. This ends up with one authoritative institution that is qualified to create new scientific widely agreed-upon terms.

Terminological work can be developed through the following measures:

- A.** Teaching and developing the science of terminology to create experienced terminologists to support the research into this field.
- B.** Giving more attention to the institutions of translation and language academies to enhance knowledge about the science of translation.
- C.** Organizing training courses in terminology for individuals interested in this field.
- D.** Enriching the Arabic library with technical dictionaries and publications specialized in terminology.
- E.** Disseminating the terminological data through journalism, mass communication and audio-visual means.

Arabicization of science and technology at higher education should be given priority to enhance and activate Arabic terminology. As a result, new terms will be created in the process of translating scientific books from other languages. It is suggested here to add a list of terms used at end of these books.

Investigating the international schools of technology in an attempt to receive benefit of their efforts in assigning, documenting and disseminating newly created scientific terms.

Taking advantage of the highest possible terminologies, such as modern computer systems, and not to rely on the traditional methods of documentation but rather to benefit from microfiche, microfilms, photo-type settings and diskettes for facilitating the storage and retrieval of information.

The establishment of a central association for translation and publication to organize gives advice and directs the Arab efforts towards translating valuable foreign books. A list of preferable books should be available to help translators determining which of these

books can be given priority.

To support various Arab academies, institutions, universities and individuals financially and morally to motivate them to enhance the quality and quantity of translated books. A symbolic reward can be of great help to evaluate and motivate distinguished works in this field.

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