

# Sci-Tech Communication: Is There a Process of Internationalization in English and Spanish?

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## RÉSUMÉ

Sans aucun doute, l'anglais est la *lingua franca* de la communauté scientifique. Les usagers qui ne possèdent pas l'anglais comme langue maternelle ont besoin de l'anglais international pour être acceptés à l'intérieur de cette communauté. En partant de ce fait, nous allons étudier la présence ou l'absence des variantes diatopiques dans la langue scientifique et technique et, plus précisément, dans celle de la médecine. Malgré cette unification linguistique, la traduction reste essentielle dans certaines langues techniques. Tel est le cas de la localisation dans le domaine du logiciel. Pourtant, les entreprises qui font la localisation de l'anglais vers l'espagnol s'entendent sur l'importance de trouver une variété universelle de la langue espagnole afin de réduire les coûts. La médecine et la localisation montrent ainsi le fonctionnement de ce processus complexe d'internationalisation dans deux langues spécifiques bien différentes.

## ABSTRACT

Clearly, English is the *lingua franca* adopted by the scientific community. More specifically, it is International English (IE), the specialized language that non-native users of English need to acquire in order to be accepted by this community. From this starting point, we will discuss the presence or absence of diatopic variants in sci-tech written language as illustrated in the field of Medicine. Despite this linguistic uniformization, translation is still extremely important in LSP, as software localization shows. Yet, companies that localize from English into Spanish agree on the importance of finding a universal variety of Spanish to reduce costs. Thus, Medicine and software localization show how this complex process of internationalization works in two different specialized languages.

## MOTS-CLÉS/KEYWORDS

sci-tech communication, medicine, software localization, International English, non-native users

## 1. Introduction

Sci-tech communication has to do with science and technology, which are, so to speak, two sides of the same coin. There are numerous definitions of science. Notwithstanding the enriching variety of the multiple approaches to science, for practical purposes, in this article we will adopt quite a standardized definition for science: the building of a rational explanation of the physical world through experimenting within the limits of an empirical paradigm. Science is, therefore, a construction continuously developing and reshaping through time and place. The same is true of technology, which is the mere practical application of science. Such a constant

evolution is only possible thanks to an international scientific and technological communication.

Language is an essential part of science, as long as it determines scientific thought and vice versa (Gutiérrez Rodilla 1998: 25-6). Now, the question is the following: does science use a special language? In other words, do scientists speak the same language as the rest of the people? Yes, they do, obviously. Why do we talk about scientific language, then? To put it briefly, we may say that language is just one, but there are different linguistic uses according to the different communicative situations. “Tell me what you need English for and I will tell you the English you need” (Hutchinson and Waters 1987: 8). That is the pragmatic essence of ESP (English for Specific Purposes), also applicable, *mutatis mutandis*, to the rest of LSP (Languages for Specific Purposes). Thus, sci-tech language – actually, the sci-tech *use* of language – must be clear, accurate and concise because science and technology aim at clarity, accuracy and conciseness.

So essential is this universal nature of science and technology that for over 25 centuries there used to be one single language – changing over history – to convey scientific knowledge: Greek, Arabic, Latin, French, German, and today, English. This worldwide diffusion-oriented monolingualism in specialized languages is what we call here “internationalization.”

Consequently, translation is a key issue in sci-tech communication. If science attempts to unify very different linguistic communities under one single language, non-native users of that language need translation both for knowing what their colleagues discover and for letting them know what they themselves discover. Thus, translation is “the great pollinator of science” (Fischbach 1993).

The purpose of our article is to discuss the presence or absence of diatopic variants in sci-tech written language. However, the scope of science and technology is too wide as to be discussed in a paper. Due to this fact, we will present an overview of the state of affairs as illustrated in two fields: Medicine and software localization.

## 2. Medicine

Clearly, English is the language of Medicine today. However, general statements like this are likely to sound vague and repetitive or redundant. Some objective numerical data may be necessary to fully realize how important English has become in medical communication (see Figures 1 and 2).

### 2.1 *Why English in Medicine?*

After a quick look at the Figures, a very simple conclusion can be reached: since 1950 the presence of English is overwhelming, compared to the rest of languages. Sheer coincidence? No. Intrinsic merits of the English language? Not at all. Some authors (Valiela 2001: 107) still argue that English is the most appropriate language to communicate science because of its conciseness, clarity and simplicity. However, this prescriptive and nationalistic attitude is not valid from a descriptive point of view. Thus, some of these myths of the English language – like its extraordinary clarity or brevity (Navarro 2002; López Ciruelos 2002) – have been refuted. Further, there are no better or worse languages. Every language is perfect for its users, who created it

and who are constantly re-creating it according to their specific but changing communicative needs. Any language is a verbal re-recreation of the world in which its users live.

What is, then, the reason for such a meteoric rise of English in Medicine since 1950? After the end of the Second World War, the United States became a power, so they could invest thousands of dollars in research and technology. High-quality medical centers – scientific laboratories, in general – moved to the States, where the excellent databases, specialized journals and leading research developed (Alcina Caudet 2001: 49; Navarro 2001: 37). Another important factor that may have catapulted English is the huge number of non-native researchers who began publishing their works in English from the 1970's (Navarro 2001: 37). As a result, English has increasingly emerged as the language of Medicine, the language of science. Thus, anyone who wants to make their voice heard in the international scientific community must write or speak in English. Science, by its very nature, has always aimed at a common language to make its communication easier throughout the world. The proposal is very useful; yet, there is a clear drawback for non-native users of English. In order to keep up with the vast volume of medical literature and be active in the medical research community, they need to translate from and into English.

## 2.2 *Translation in Medicine*

Spanish physicians are one of the best examples. Spain is not a bilingual country, not even in the broadest sense of the word: despite being taught at elementary and high schools, English is not spoken as a second language or a *lingua franca* in Spain. Thus, writing their research in English becomes a hard task for Spanish researchers. The linguistic problem is not so much terminology as rhetoric. In other words, they know the specialized vocabulary, but they are not able to transfer the structural and persuasive discourse patterns of Spanish medical research articles into the corresponding English ones.

Contrastive rhetorical studies have shown how metadiscourse varies across languages (Mauranen 1993; Crismore et al. 1993; Valero Garcés 1996). Any language has its own way of organizing textual information and expressing the attitude of the author towards the content and the readership. Hedging, for instance, illustrates the paramount importance of this issue in scientific articles (Hyland 1998). Some examples of hedges are *sort of*, *probably*, *seem*, and *may*. Sometimes these elusive words, more often regarded as negative politeness strategies than as precision qualifiers, make the difference: “Our results demonstrate that...” and “Our results seem to suggest that...” Like French, Spanish is a much more “right to the point language” than English. That is why hedges are a distinctive feature of the English language, but they are not so frequent in those two Romance languages. These linguistic differences, whose origin seems to be cultural, have also been proved highly relevant even in scientific and medical texts (Salager-Meyer 1994; Salager-Meyer, Alcaraz-Ariza, Zambrano 2003). On some occasions, the acceptance or refusal of original manuscripts in medical journals may depend on the appropriate usage of this linguistic strategy, rather than on the scientific quality of the article. Albeit interesting and related to the topic, this is not the specific type of problems our paper intends to discuss.

Let us recapitulate. So far we have introduced the paradoxical nature of science: starting from particular facts discovered through research in any country in the world, science jumps to universal conclusions, and states them in one common language. The international scientific community has always agreed upon the use of that language in order to make scientific ideas overcome the language barrier, thus spreading to all the scientists throughout the world and eventually becoming part of the common knowledge of the layman. Today, for extralinguistic reasons, that common language is English. Now, the question that remains to be answered is: what variety of English: American English, British English...?

### 2.3 *A diatopic vs. a functional variety*

The question is not new. It was explicitly formulated as a dilemma at least 20 years ago. Robertson and Robertson (1983) showed the pros and cons of American or British English being the international language of science. On the one hand, American English might be preferred because of its greater number of speakers and its scientific predominance of the States. On the other hand, the authors continued, British English might be preferred for various reasons: political – the remembrance of the Cold War was still alive in the 1980's, so British English was politically neutral, as opposed to American English –, historical – English was born in Great Britain – and geographical – the colonies of the British Empire –. What did the authors conclude? Under no circumstances should nationalistic criteria determine the choice of a standard scientific language. The only criterion that must be borne in mind is to ease the transfer of scientific knowledge.

That is the key issue. In fact, leaving aside numerous phonetic-based spelling reforms,<sup>2</sup> this need of a universal variety of English dated back to the 1930s. It was then when “BASIC English” (British, American, Scientific, International and Commercial English) was born. Essentially, this modified variety of English, proposed by C. K. Ogden and I. A. Richards, was a list of 850 words and some simplified grammatical rules (Ogden 1930). Such a drastic lexical reduction – a claim which, by the way, was not strictly true – was severely criticized on the grounds of missing the point that the main linguistic difficulties arise from syntax and morphology rather than from lexicon. Apart from that, longer phrases and periphrases would be necessary to make up for that lack of terms. This fact would make the language less precise, concise and clear, which is totally against scientific principles. A similar but more refined proposal was launched in the 1980's by Randolph Quirk under the name of “Nuclear English” (Quirk 1982: 37-53). Nuclear English would be a modified variety of natural English with fewer ambiguous structures. A more successful but restricted proposal was what John Kirkman terms “Controlled English” (1992: 151-4). Firstly used by large international companies to facilitate their employees' understanding of their technical documentation, this variety of lexically and grammatically simplified English was later applied to international communication in professional settings such as aviation or navigation.

Some years ago, Kirkman himself suggested the application of Controlled English to medical writing (1996). He advocated the avoidance of informal expressions, parochial and unfamiliar words, and complex sentences in order to help medical colleagues overseas with a limited command of English. Despite its pragmatic orientation – writ-

ing in English in order to be easily understood by an international audience, that is, adapting the language to this particular communicative situation – Kirkman’s “linguistic courtesy” was not welcomed by some colleagues, who argued that linguistic simplification implies mental simplification (Heath and Björn 1997). There is nothing wrong about seeking to reach the widest possible audience and taking into account that most of the international medical research audience is constituted by non-native users. What might be considered to be the weak point of Kirkman’s proposal is his placing emphasis only on the native users’ responsibility of effective scientific writing. He does not ignore the fact that non-native users outnumber native users, but he might be overlooking the concept of International English. International scientific writing is a matter of compromise between native and non-native users; yet, as we see it, this implies not only how native users should write, but rather how non-native users *actually* write. Hence, natives do not necessarily have to change their writing so drastically so that non-natives can easily follow and imitate their pattern. Native users should recognize the legitimate communicative status of a non-native use of English, that of International English.

#### *2.4 International English (IE)*

IE has remained for years an umbrella term for almost anything under the sun, from the distinctive features of world Englishes to the common core of those varieties, from the basic English used as a lingua franca to the kind of English used by international professionals (Ross 1997). However, it seems that it has started being rigorously described thanks to some studies (Jenkins 2000). Apparently, a consensus has been reached upon what the term designates: IE refers to English used as an international language (Seidlhofer 2002). Thus, today’s lingua franca is not English but IE. This distinction implies that native standards, be they British and American, are no longer the only ones. IE is a denationalized, stateless, “flavor-free” English (Gutiérrez Rodilla 1998). This is so in general language and in professional settings, like sci-tech communication. For the time being, IE cannot be fully described as a particular identifiable variety of English. The linguistic analysis required for that is not ready yet. But we are on the way. There are several studies going on, the most important of all of them is the Oxford-Vienna Corpus (Seidlhofer 2001).

Regardless of the lack of any comprehensive or detailed description, some facts are indisputable. Scientific monolingualism has always been there for more than 25 centuries as the best way to reach the widest possible audience. Some sixty years ago, for non-linguistic reasons, English became the language of Medicine. Today, thanks to the dramatic increase of non-native users throughout the world, English has been surpassed by IE.

### **3. Software localization from English into Spanish**

We will start by defining the concept of software localization. Software localization is the adaptation and translation of a software product, along with its documentation and on-line help, so that it meets the needs of the end-user in the target market.

Spanish is the fourth most spoken language in the world, with over 400 million people who share the same language. 22 countries, including the United States (US),

speak Spanish, which has evolved with its own peculiarities in the different countries of Latin America and Spain in order to adapt itself to the needs and reality of the different linguistic and cultural communities that speak it. There are, moreover, 22 academies of the Spanish language in the world, representing its different varieties and idiosyncrasies.

Which one is then the reality of Spanish? Does this mean that Spanish as spoken in Argentina totally differs from the Spanish spoken in Mexico and this one from the Spanish spoken in Colombia or in Spain? No, it is the same language (Salvador 2002: 110), with some differences in pronunciation and some syntactic differences but, above all, lexical differences along with the use of local conventions to represent currency, dates, measurements, telephone numbers and so forth, which turns software localization for Spain and the different markets of Latin America a challenge in itself.

The correspondence between countries and languages is not a simple mapping. The fact that several countries share the same language does not mean that they also share the same culture and local conventions (Hall and Hudson 1997). For example, English as spoken in Great Britain (GB) differs from English as spoken in the US, especially regarding vocabulary, pronunciation and spelling. Therefore, the software developed in the US has to be localized for the British market. In the same way, there are varieties between Spanish as spoken in Spain and Spanish as spoken in Latin America. It is at this moment that we fully understand the idea of *locale*: a potential market that shares the same language, culture, local conventions and local practices. Localization is not only translation, but also the adaptation of a product to the social and economic reality of more than twenty countries, in our case.

The case of multimedia products that include voice, such as speech-recognition products, is an even more complex one, since accents and pronunciation play an important part. Nevertheless, we are going to focus ourselves on software products that do not include voice.

### 3.1 *Neutral Spanish*<sup>3</sup>

Translators speak of neutral Spanish, universal Spanish or Mid Atlantic Spanish. But, what is neutral Spanish? We could define it as a variety of Spanish that does not include localisms or regionalisms, nor colloquial expressions peculiar to each country, nor connotations.<sup>4</sup> It would be a clear, concise and precise Spanish variety for all Spanish-speaking countries.

### 3.2 *What do translators do?*

Translators have two options: they can either localize the same product into 22 different versions for each of the Spanish-speaking countries, which would involve high costs and delays in putting the product into the market, or they can localize the product into one localized version.

The need to agree on a single variety of technical Spanish which is understood by all Spanish-speaking users is a pragmatic one: to save costs and aim at *sim-ship* (simultaneous-shipment) of the product. But, how can localization vendors achieve only one localized version of the product if we have stated that the main objective of

the process of localization is that it must fulfill the needs of the end-users in the target market? Localization agencies have their own style guides and glossaries along with linguists, translators and experts from every country where they are going to sell the product that work together to agree on a common terminology. Among the publishing companies that aim at a unique Spanish localized version as neutral as possible are the following:

- The president of *M2 Limited*, Mercedes Pellet, thinks that a possible solution would be to include a glossary based on terms accepted by the *Real Academia Española*, along with a definition of the term and regional variants. According to her, there is no need to localize a product into 22 different variants of Spanish, as if they were all different languages. Linguists of each country have to work together and agree on a common terminology.
- Another example is a publishing company of software books based in Madrid, *Pearson Educación, S.A.*, which publishes both for Spain and Latin America. One of their members, Alejandro Domínguez, argues that the lexical differences are only punctual examples of different cultures that share the same language. For this company, with the appropriate work and effort, it is possible to obtain a glossary of the product-specific terminology. For example, in Spain, the term *ordenador* is used meaning *computer*, due to its geographical proximity to France, while the Latin America term is *computadora*, due to its geographical proximity to the US. Since in Spain the term *computadora*, though not used, is understood, in *Pearson Educación, S.A.* they opt for the latter term because *ordenador* in Latin America has a different meaning. It is all about a compromise. The economy is first and it does not pay off to localize individually for each of these countries. In their books they omit terms that may have a connotative or offensive meaning in some countries. This has allowed them to reduce costs and increase the sells in both Spain and Latin America.
- An independent consultant of the Argentinean-based localization company *Ushuaia Solutions*, Patrice Martin, insisted on the fact that it was not that there was a universal Spanish, but that the companies were the ones that created it for economic reasons and in order to facilitate the maintenance of the software. Before starting to localize a software product, the company draws up a business case, i.e., an economic plan that studies the potential of each market where the product will be sold. The next step is to gather consultants – experts in the product functionality – along with linguists and translators from Argentina, Colombia and Mexico in order to create a glossary of terms. Different variants of the same term are suggested and the experts of each country warn of the possible connotations that the term may have or if the end-user would easily understand and follow the guidelines without problems. It is all a matter of compromise; for instance, in order to represent the date, Mexico uses the local conventions of the US, due to its geographical proximity, while Argentina uses the local conventions of Spain. Therefore, *Ushuaia Solutions* uses the local conventions that all countries can understand, although, as in the case of Mexico, they are not the preferred ones. Experts and end-users validate the final product. If they all agree, the terminology used in the graphical user interface is frozen and the translators can then translate the on-line help and the documentation. They have style guides in order to follow some specific grammatical, format, and punctuation rules.
- Software publishing companies, such as *Microsoft*, *Apple*, *Novell* or *Lotus*, also have glossaries, style guides, and linguistic reviewers with the aim to localize their products into one unique neutral Spanish. For instance, *Microsoft* and the *Real Academia Española* in 1999 signed an agreement whereby *Microsoft* incorporated the Academy's dictionary and spelling checker into their products. *Microsoft* could be seen, therefore, as a technical language academy, because their choice of terms for the graphical user

interface affects the terminology of other products that want to be compatible with those of Microsoft. Microsoft also does one localization version of their software products into Spanish. One example of how they agree on a unique and neutral terminology is seen in the use of the terms *ordenador* (Spain) and *computadora* (Latin America). Instead of those terms, they replace them with the term *PC*. Another example is the use of the articles: should they say *el PC* (masculine) or *la PC* (feminine)? Again, neither. They replace it by the possessive adjective *su*, which does not reflect gender.

Many companies, as well as *Microsoft*, also adopt the terminology of *the Real Academia Española*, as the institution that unifies the Spanish spoken in all 22 countries. The reason behind this may be that the Academy coordinates its work with the other 21 Academies of the Spanish language with the aim of working together for the unity and integrity of the common language, as well as having a normative or prescriptive value in these countries.

### 3.3 Terminological problems

The problem frequently stems from the fact that new software technologies continue faster than the work of the linguists of the language academies, and translators have to come up with new terms. Sometimes the English term is so well rooted in the community that it is very hard to convince the users to employ the Spanish term instead. Such is the case for the terms *software* and *hardware*. In other instances, both terms are used interchangeably, for example, *website* and *sitio web*, *e-mail* and *correo electrónico*, *homepage* and *página de inicio*, (Castro 1996), etc. (see Table 1). As we have previously shown, on many occasions the choice between the English and the Spanish term depends on the geographical factor, i.e., the proximity to the US, as is the case in the Latin American countries, or, on the other hand, the greater influence of French, as it is the case for Spain.

Many times, when the translator does not find an appropriate term in neutral Spanish, he or she ends up using the anglicism, which brings us to another question: are anglicisms really necessary in software language? Pedro José Sampedro Losada, member of the *Asociación de Técnicos de Informática*, points out that many of the outrages against the Spanish language, in the field of computers, are due to the continuous use of anglicisms (2000).

Along with each innovation and scientific hypothesis there is a problem of terminology and translation. L. Carreter and V. Tusón (1978) explain that this task is carried out following one of these procedures:

- Adopting the term (anglicism in most instances).
- Adapting the term with the spelling of the target language (see Table 2).
- Translating it for a term in the target language, even though it may be a calque (see Table 3).

The decision is not an easy one. Is it easier to adapt them, adopt them or translate them to make communication among scientists easier? Monosemy and international diffusion are the two main characteristics of technical and scientific language. Therefore, should we imply that the best option would be to keep the English term? This does not seem to be the best decision if the proper terminology exists in the Spanish language, since the fact of not translating them would mean an impoverish-

ment of the language (Carreter and Tusón 1978). According to Sampedro, anglicisms are sometimes necessary, but only in a particular context where there is no term in Spanish and no other solution (2000).

#### 4. Conclusion

Throughout history, there has always been one language that has acted as the *lingua franca* in sci-tech communication in order to overcome barriers and facilitate the spread of new findings. From the beginning of the 1950's and even earlier, English has clearly become that language and several proposals were launched to make English even more universal: BASIC English, Nuclear English, and Controlled English. However, none of those "artificial" attempts succeeded. Instead, as a result of the natural evolution of language, today's *lingua franca* is International English (IE). IE is a standard variety of the English language characterized by simplified grammatical rules, a concise and clear structure avoiding ambiguity along with a fixed terminology, a lack of colloquialisms, slang or any other idiomatic variants. Diatopic variants are also excluded from IE.

While science aims at a common language, technology has a much more concrete aim. For example, software localization into Spanish would, in theory, imply the translation and adaptation of a software product to the needs of the end-users in the 22 Spanish-speaking countries, obtaining 22 different variants. However, most of the time technology is in the hands of commercial companies that are also seeking economic benefits apart from terminology normalization. That accounts for the existence – or, rather, the careful artificial design – of a universal or neutral Spanish: the "production" of a unique variant of Spanish that may sound unnatural to some end-users, but is easily accepted by all of them.

With all this in mind, some conclusions can be drawn (Table 4). The phenomenon of internationalization may be considered as typical of sci-tech language. This idea may well be extrapolated to the wider scope of the rest of LSP; however, further research is needed to confirm this hypothesis. Yet, although the explanations are quite diverse, two facts seem certain: 1) internationalization in sci-tech communication produces universal linguistic varieties whose functional scope is restricted to certain international contexts of use; and 2) the appearance of those varieties can be explained only in pragmatic terms. Thus, the importance of reaching an international heterogeneous audience in Medicine results in "medical IE," an English variant that only exists in international medical research journals. Likewise, the economic interests of software localization result in a "neutral Spanish," a Spanish variant that only exists in our computers... or PCs.

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## NOTES

1. Holder of a research grant from the Spanish Ministry of Education, Culture and Sports.
2. Some examples of these spelling reforms are the Phonotypy, created by Isaac Pitman; the "Shavian" alphabet, proposed by G. B. Shaw; or the New Spelling that the Simplified Spelling Society presented before the Parliament in 1949; and, obviously, Noah Webster's spelling adaptations.
3. It is important to specify that when we talk of "neutral Spanish" we are referring to the technical language, not general language.
4. Notice the similarities with Controlled English (cf. 2.3).

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APPENDIX

FIGURE 1

Evolution of some of the languages of the medical articles included in the database *Medline*.  
 (Source: Anuario 1999 del Instituto Cervantes)

Medicine all over the world: some languages  
 of the articles included in *Medline* (%)

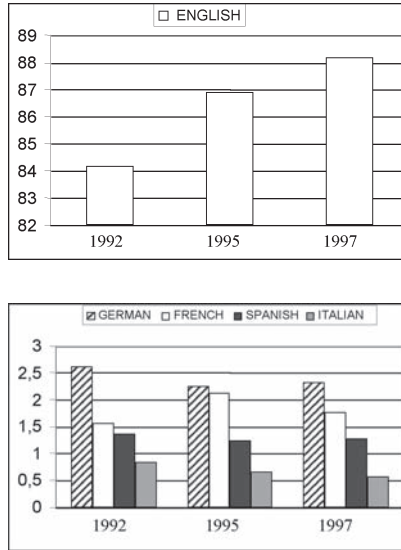


FIGURE 2

Evolution of the language of references in the Spanish medical journal *Medicina Clínica*.  
 (Source: NAVARRO 1996)

Medicine in Spain: language of the references  
 in the medical journal *Medicina Clínica* (%)

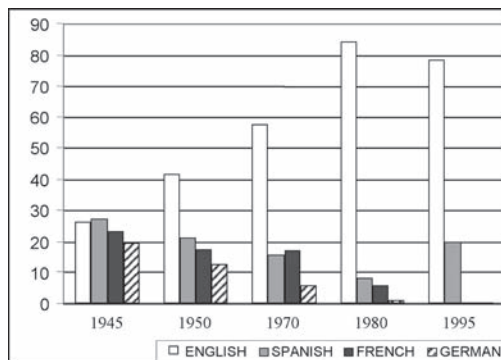


TABLE 1

## Terms with a Spanish translation co-existing with their English equivalents

English Term	Microsoft	Novell	Users
<b>Backup</b>	Copia de seguridad	Copia de seguridad	(1) Un backup (2) Una copia de seguridad
<b>Bitmap</b>	Mapa de bits	Mapa de bits	(1) Un bitmap (2) Un dibujo
<b>Byte</b>	Byte	Byte	(1) Un byte (2) Un octeto
<b>Cookie</b>	Cookie	Cookie	(1) Una cookie/ cuqui (2) Una galleta
<b>CPU</b>	CPU	Unidad de procesamiento central (CPU)	(1) La CPU (2) La unidad central
<b>E-mail</b>	Correo electrónico	Correo electrónico	(1) Un e-mail (2) Un correo electrónico (3) Un emilio (youngsters)
<b>Input / Output</b>	Entrada/ salida	Entrada/ salida	(1) El input y el output (2) Entrada y salida
<b>Link</b>	Vínculo	Enlace	(1) Un link (linkar) (2) Un vínculo (3) Un enlace
<b>World Wide Web</b>	La World Wide Web	La World Wide Web	(1) La Web (2) La Telaraña Mundial (3) La Malla Mundial

TABLE 2

## English terms adapted by the users to Spanish spelling

English Term	Microsoft	Novell	Users
<b>To chat</b>	Conversar	Charlar	Chatear
<b>Applet</b>	Subprograma	Aplique, applet	Un áplet
<b>To click</b>	Hacer clic	Hacer clic	Hacer click, hacer clic, clicar, cliquear
<b>To forward</b>	Reenviar, retransmitir	Reenviar	Forwardear Forguardear
<b>To reset</b>	Restablecer	Reinicio	Resetear, hacer un reset
<b>To surf</b>	Explorar	<b>Explorar</b>	Surfear (la Red)

TABLE 3

**Calques**

English Term	Microsoft	Novell	Users
Snail mail	-----	Correo lento	Correo caracol
Download	Descargar	Descargar	Descargar
Customization	Personalización	Personalización	Customización
To index	Indexar	Indexar	Indexar

TABLE 4

**Conclusions**

	MEDICINE	SOFTWARE LOCALIZATION
<i>COMMUNICATION TYPE</i>	S C I - T E C H	
	<b>Expert - expert</b>	<b>Expert - user</b>
<i>AIM</i>	Maximum spread of medical research	Complete adaptation of the product to the target culture and language
<i>WHY ONE NEUTRAL VARIANT?</i>	To facilitate the integration of non-native researchers	Economic reasons Terminological standardization