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## **Voice Recognition Systems Toward a Universal Language**

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### **Abstract**

An analysis of the major achievements of the last quarter of a century (means of transport and of communication, microelectronics, the conquest of Space, the globalisation of Society, computer networks, blocks of countries, the proliferation of International organisations and so on) would seem to suggest the need for a scientific study into the possibilities of a universal language. A real need exists, every day more pronounced and we consider that this is the right time for this investigation. As a part of this project a discussion of possible alternative solutions is proposed (the use of a multi-lingual approach, English, multilingual intercompression, an international auxiliary language, "manufactured" languages, automatic translation, natural language, among others). There is also a definition of the theoretical specifications which this language should meet, taking into account all the current needs and the sectors involved (voice recognition, automatic translation, operative systems, programming languages, documentation, simple cross-cultural learning). The idea is based on a dual focus: person-to-person communication and per-

son-to-machine communication. In order to achieve this double objective we shall select a set of universal sounds and phonemes which are common and understood by all people. The selection of this set of universal sounds and phonemes will be such that it will be easy to undertake a spectral discrimination. The phonetic, lexical and grammatical organisation of the language will be established according to distinct levels of difficulty. Written forms will be expressed making use of the most appropriate phonetic transcription in each language. Design and development will be based on the Internet as a platform for investigation, cooperation and the consensus of hundreds of experts and a strategy is proposed for learning and spreading the language.

**Keywords:** voice recognition, automatic translation, universal language

### 1. Introduction

It is the present-day need for a common language between not only people, but also and perhaps more importantly, between people and their machines, which has led us to commence this project.

It may seem that the search for a set of reasons to justify the creation of a universal language would be a fruitless task, since five minutes of anybody's time would be enough to find good arguments. Nevertheless, it is of interest here to highlight series of them for their importance.

First, the importance of the Media over the last half-century and the increased ease of transportation which has led us to a situation of historically unprecedented social interaction, perhaps restrained only by the barriers formed by the local languages of each country.

Additionally, the concept of the Global Village, as it spreads, unrestrained, during this turn-of-the-century, with unmistakable features, such as the INTERNET, the globalisation of the economy and of markets, the proliferation of international organisations, agree-

ments between nations, such as the European Union and Mercosur.

Moreover, the inevitable conquest of Space to be undertaken in the coming century, a task which will only be possible to realise with the effort and cooperation of all the World's countries. There can be no doubt that the existence of a tool as powerful as a common language will accelerate this process notably.

Besides, communication with machines in a way which is simple, direct and universally accepted, without having to rely on excessively technical resources. Nor should we overlook the future emergence a great number and variety of new intelligent machines.

Also, the economic and intellectual costs, as well as the time required, to learn a variety of the most important languages: English, Spanish, French, German, Russian and many more, just as important, but impossible to list here. We might add to this the difficulty, in certain cultures, of learning languages other than one's own.

Furthermore, the possibility that a universal language might become a second mother tongue, which future generations will learn in unison with their own language, as happens right now in bilingual countries.

Likewise, we are aware that it is geographical separation with continues to define linguistic diversity in its most general form, although other factors such as time, politics and other social determinants have also to be taken into account. It is for this reason that, at a moment of time, such as the present, when those political and geographical frontiers are beginning to disappear, that it seems perfectly reasonable to consider the possibility of a common language.

Also, the case of Europe, where the unification of many important aspects (currency, international and social policy) is being carried out, leads us to a situation in which both major languages and minority regional languages are of paramount importance. This linguistic fragmentation is not conceived as an unwanted problem to be solved, but rather as a symbol of national identities and as an unalienable political right. However, this also implies that the opera-

tions of all European institutions suffer from the handicap of the multitude of languages which must be taken into account. There is no doubt that cases such as this demand the investigation into the adoption of a common language, which, for obvious reasons, should not be one of those of a participating nation.

Moreover, the translation and interpreting services of the distinct international organisms (U.N., NATO, E.U., etc.) account for an important proportion of their budgets and represent an enormous amount of spending on what are quite unsatisfactory results. Added to this we must consider that this whole set up is very prone to failures, breakdowns, strikes, illnesses and other weaknesses. Furthermore, all these resources, at the service of the organisation of this type, are of absolutely no use to the normal citizens and small businesses who have no access to them. In fact, it is precisely these same people who now travel abroad more for different reasons, whether it be for pleasure, on business, sports or to study.

Additionally, we are immersed in a period of time in which this same phenomenon can be seen in different parts of the World, where linguistic chaos with the fragmentation of national languages into languages representing small territories, the problems generated by the growth of nationalism, seem to indicate a shift in the opposite direction from the one which we are proposing. Thus, it seems that the attempt to propose a universal language is all the more difficult, although common sense would suggest that the tendency in that direction will be seen to diminish.

As well, following on from this analysis we can sense that the World is subject to a dual tendency. On the one hand there is the movement towards unification, represented by globalisation, unions between countries, international organisms and so on. On the other, and perhaps as a reaction to the aforementioned unification, we see the emergence of nationalistic movements. The appearance of a universal language might serve to diffuse the tension which exists between those nationalist movements and their parent nations.

And as an aspiration, the dream of a common language is by no means new and could already be seen in the 17<sup>th</sup> Century and the ensuing centuries witnessed its development, continuously reinforced by the evolution of thought, of science and of civilisation. As one of Mankind's ambitions, it is bound to become a reality at some moment of time as have so many others - the conquest of the seas, flight and Space among them. These ancient, incessant dreams of humanity are deep-rooted wishes of the past which become the realities of the future.

Likewise, the repeated failure of all these experiences, which some authors identify as almost five-hundred, with the exception of Esperanto, may be put down to a number of causes, some of which are to be dealt with in other sections of this study. Above all, there are two major problems. Firstly, an excessive personalisation and "patriotism" of the creators of these languages and secondly, the proposals for languages which are excessively conceptual or academic in their nature.

Furthermore, the United States of America is one of the countries with possibly the highest degree of monolingualism, above even those so-called third-world societies, and in which bilingualism is considered as nothing more than a necessary evil. This concept of the hegemony of the use of a language only goes to show the necessity for an alternative approach and above all, for proposals which originate from outside that society.

Equally, possessing the knowledge of a universal language is useful in practice. If its acquisition is easy and then it will be accessible to all, blind to differences in intelligence or wealth and with it, people of all races, nationalities and classes will be in direct contact under conditions of equality. It precisely removes the disadvantages of one person using a language which is not their own to communicate with another who is.

Moreover, the world is also moving along with another tendency which is interesting to mention here and which we may describe as

the idea of consensus. The great organisations which control society are pluri-national and their policies and decisions are necessarily taken with the consensus of all and this is one of the strategies we shall consider when developing this language. It will include a pluri-national project which, as well as the purely scientific criteria, will establish a consensus mechanism in the election of the different technical parameters of the proposed language.

Additionally, the great majority of people speak just one language. There is a significant number who speak two languages, mainly in those countries where it is necessary to do so. The number of people who know three languages is low and those who speak more than three may be looked up to as deserving of our utmost admiration. The stark reality is that encounters between speakers from different countries are often characterised by the very low level of communication.

As well, to solve these linguistic problems two remedies have been tried. Firstly, through the use of interpreters and translators and secondly, through the use of a common language. In both translation and when using an interpreter, two people exchange ideas through a third person and they depend on the experience and willingness of that third person.

Also, as final point we would like to clarify that the sense of this proposal is not to define a new language in its most precise manner, but to raise consciousness as to the need for this language, to make suggestions as to how it might be carried out and for a methodology. We intend, therefore, unlike other proposals for a universal language, to create a language between all, for all and with the consensus of all.

Finally, the multiplicity of factors which we have mentioned in this section leads us to the conclusion that a real need does exist and that, day-by-day, this need increases. In the same way we see that society evolves in all aspects, economic, technical, social, political and so on and that it becomes ever more pressing. We believe that

the moment has come to launch a project destined to succeed, of these characteristics.

## 2. Discussion

The question to be argued over may be which model for a common language is to be implanted. Should it be English? Should two or three natural languages be promoted here or should Esperanto or any of the other "manufactured" languages be adopted? Should a series of conditions or behaviours be sought for each distinct area in which the new language is to be used?

It seems logical to us to try and establish a discussion in favour of a new language or sub-language, as opposed to the other possible solutions.

The historical experiences of implanting a new universal language, as in the case of Esperanto (c.f., Auld 1988) have not produced positive results, due principally to three reasons:

Firstly, the period in which it was developed was not one of urgent need due to the lack of means of transport and of communication.

Also, these new languages are based on Western vocabulary and grammar, and no account is taken of the world's other cultural zones such as Asia, the Arab countries, Africa, etc. Therefore, there exists an element of discrimination which unconsciously affects its implantation.

And, the appearance of microelectronics, computers, the conquest of Space and the rest of these new challenges, which have affected human society so deeply, were not contemplated in its design and have therefore added a further negative factor in its diffusion.

Opposed to this, the idea which we propose is based on universal concepts, both in its intrinsic scheme and in its design and development.

Another argument against the adoption of a new universal language is that English fulfils this role. We shall consider and evaluate this point to the extent that it is useful to do so:

First, a great number of the people who learn English do so because they are obliged to, for professional or academic reasons, in order to travel and so on and not because they consider it necessary for the evolution of society.

Second, the sociological demands of many peoples require a language other than English, for reasons of cultural pride and due to factors such as the possible imperialist connotations or memories. This can be clearly seen in all international programmes where English may be the "official" language but where all participating countries demand the inclusion of their own language in these events.

Third, due to its phonetic structure, English would not technically be the most ideal language to be considered as the universal one.

Additionally, we should not forget that the centre of world power may shift, just as it has done at different times of history. One out of every four of the world's inhabitants speaks Chinese and that country is undergoing rapid development. What future lies ahead? Almost half of the world's natural resources are to be found in South America. What will happen to them in the future?

And it is also true that English is used internationally in certain well-defined fields and in some regions it is the norm but the idea that one can get by with English in any part of the world is pure fantasy. There are vast areas of the planet where English is simply not represented: China, Japan, Russia and South America for example.

There is an interesting concept which has emerged spontaneously and which is known as the lingua franca or as an "IAL", an International Auxiliary Language. As an example of this, we have Spanglish which comes mainly from the USA, a cross between the two main linguistic groups. The existence of these vehicular languages, which are generally based on a minimal lexicon, mixed with

that of other languages and a simplified grammar, is still an uncontrolled phenomenon, holding to no apparent rules and very much subject to prevailing fashions, as well as possessing a strong local content.

One solution proposed and implemented by many nations, especially in Europe, is the strong encouragement of teaching other languages, thus contributing to the plurilingualism of students. We could discuss at length the European programmes currently in operation, Socrates and Leonardo de Vinci, Erasmus and so on. All this effort has expressed itself in an important increase in the number of teaching hours given over to language learning, this accounting for nearly 20% of all secondary school teaching. The results obtained from all this work are rather poor, since at the end of this stage of schooling, the student is still not able to understand a native speaker of the language which has been studied.

No doubt, a much smaller effort both in terms of economic resources and of teaching hours, would be necessary to establish a new universal language, which would always have a much more simple grammar.

As a consequence of the outlook we have described above, there are new linguistic programmes known as multilingual intercomprehension (c.f., González 1998: 41) whereby each person speaks their own language, whilst understanding that of their interlocutor, especially if they are both of the same linguistic family. This proposal seems quite reasonable, as it benefits from indisputable advantages compared to the policy outlined above. In this case the student only has to study oral comprehension and at least at the early stage, can forget about oral expression, written comprehension and written expression completely. Here, the student has only to study one skill, he or she will obtain good results in a short time and this will provide enormous motivation.

Although this may be an effective solution in geographic zones such as Europe where there are currently 11 official languages and 8

regional ones in the 15 member countries at present. In the very near future it is forecast that there will be 25 countries which, by any analysis, will involve too many languages to make viable a multilingual system or indeed, multilingual intercompression.

It might be something of a risk to say so, but we consider multilingualism to be a utopia, at least far more so than the proposal of creating an artificial language.

At present there is much work in progress in the development of computerised natural language and voice recognition analysis systems and these will, no doubt, end in success (Díez & Escalada 1996: 422). However, these systems will be established in the most important languages such as English, French, German, Spanish and a few more, whilst for the rest it will be very difficult to complete the task, for technical and economic reasons. We face the eternal problem, namely discrimination, in this instance, cultural, and the inhabitants of those areas have no remedy but to become speakers of the "privileged" languages if they wish to gain access to the new means of communication.

One argument states that electronics and computers will shortly provide us with a system of voice recognition and automatic translation and it is quite easy to go further and suppose that the "gadget" required will be as small as a cigarette packet and some earphones. All that would be required for those who need this multilingualism would be to carry this thing around and we also suppose that the system would work in real time, in such a way that two speakers of different languages would be able to communicate normally, each one using his or her own language. Following this same line we suppose that this conversation would be possible between several speakers of different languages and that this "gadget" would even contemplate those variations and peculiarities present in each language and in every one of their dialects and sub-languages.

This scheme seems possible, but the reality is that fifty years' work has already gone into it with results which are not very en-

couraging and so, it seems that we shall have to wait many more years to see it in action, if, that is, it comes at all.

Another aspect of the problem consists in supposing that if the voice recognition systems are to become widespread among simple machines, it might be advisable to choose a set of basic commands (words) from some natural languages, thus creating a mini-language. At heart, this solution is contained within the proposals we are making.

To conclude this section, we might state that it seems quite reasonable, under present conditions, to study the creation of a universal language, in its theoretical facet, as a possible solution to the linguistic problems we are facing at the present time.

### **3. Specifications**

At the present time, the design of a new language requires certain conditions which were not even dreamt of in centuries gone by, since the emergence of micro-electronics has granted machines a versatility and complexity which grows daily and which, in the not too distant future, will oblige us to establish spoken communication with them. Furthermore, if we think of the enormous interrelation which will exist between this language and computers, we have before us a tool which was not considered in previous times and which will be of great help to us, since long distance communication will be controlled by computer systems.

On another level, in those times, the need for a universal language was practically reduced to its written version by the great difficulties in communications. Today, this model has been turned on its head by the ease of transportation, communication, computers, and what prevails today is the spoken form.

For this reason we shall define the most essential specifications in order to cover the current needs of this language, of which we

might suggest those which follow (1):

- (1) a. It should be a common language between people and machines and it will be principally spoken.
- b. It will be a language dedicated to communication, conceived as a tool for work, used as a "bridge language" by automatic translators between the world's present natural languages.
- c. The written transcription from one language to another would be carried out by computer.
- d. The grammar should be structured, simple and easy to learn; so its grammar will be designed in order to help operative systems and programming languages for microprocessors. And the grammar should incorporate recently developed thesaurus and search techniques. Also it may be structured as a sub language within natural languages, as we may consider types of jargon or technical sub languages. And finally, it will have a small base of sounds, if possible, those known by all, universal sounds in order to make learning it very easy.
- e. We propose the establishment of different levels of difficulty, both in the phonetic system—sounds—and in the lexicon and grammar.
- f. From this language we can obtain a sub-language, which would be the level of minimum difficulty, to be used to communicate with machines, to form the hard, central core of the language. This development will be undertaken by an international, multi-disciplinary team of researchers and with the cooperation of the general public. And there will be no attempt to create a laboratory-produced language, but rather, one which is related to people.

## 4. Objectives

As a consequence of all the above, we propose as an objective, the development of a common language for use by all human beings and one which will also work as an interface for communication with machines, easy to learn, of rapid implementation in society and which is the result of the cooperation between many people from around the world.

## 5. Ideas/Approach

The fundamental idea is based on three concepts. First, a **mixed system** of "phonetics" is proposed, made up of phonemes and syllables or sounds (alphabetic and syllabary) instead of solely phonemes (alphabetic). Common, widely-used, **universal sounds** will be selected. As examples we may include the musical alphabet, onomatopoeic, imitative, natural, animal, infantile and international sounds and those phonemes which may be considered as universal to a greater or lesser extent. These sounds are sufficiently differentiated in the auditive spectrum to be **clearly discriminated** by a computer with little chance of confusion. Differences in tone, pitch or intensity between one person and another will not affect the clarity of the signal.

Second, **different levels** of difficulty will be planned, starting with a simple level using few sounds, for communication with machines, progressing to the highest level which will be similar to natural language.

Third, a **different pattern of writing** will be used in each language, making use of the closest phonetic transcription to that language and to the phonetic rules of the said language with the aim of reducing the need to learn spelling and writing rules.

Fourth, the basis of **development** will rest upon the collective

opinions of experts and collaborators throughout the world, using computer networks as a support, communication vehicle and research platform. During the design period, participation and consensus will be basic as pillars of investigation. The design will be carried out with the premise of the ease of learning for the world's different cultures with the ever-present idea of a generalised **diffusion**.

It is the union of these ideas which will allow us to construct a true universal language, the fruit of the consensus of a great number of speakers and which comply with the diverse needs present in the current global situation.

## 6. Technical Considerations

We shall see the technical principles upon which this language may be based:

### 6.1. Phonemes/Syllables

This will, perhaps, be the most widely-argued point, since all Western languages at this point, are based on phonemes and none are syllabic, but this should not lead us to doubt the viability of this concept, since in ancient times this kind of language did exist.

In articulate sounds and in onomatopoeias we find linguistic signals and symbols of the pre-structural type, thus their primitivism, which nevertheless, from the acoustic point of view, possess a very rich voiced spectrum.

We might also point out the existence of a set of expressive sounds - clicks, hoarse sounds, coughs, sighs, inarticulate exclamations and so on, which exist alongside the language and which are used by people who possess a high level of culture.

Within this concept restricted to sounds, would also incorporate those which meet the specifications which we have stipulated

throughout this report (wide acceptance, spectral discrimination, ease of learning), thus obtaining a mixed syllabic/phoneme phonetic structure.

As an example of this mixed structure, we can analyse the mimed sign language used by the deaf and dumb and which is composed of a common alphabet shown with the hands and containing a set of "sounds", from body expressions to indicate concepts of greater or lesser degree.

In any case, there have been two very important arguments which have led us to select this concept (2):

- (2) a. We seek a system of oral communication, something which all humans hear in the same way.
- b. Nobody should feel discriminated against and we therefore need a common phonetic base which is both general and easy to learn.

## 6.2. Universal Sounds

The fact of choosing a mixed phonetic structure (one phoneme or many syllables) is in close relation to the need for the chosen sounds to be universal.

Among these sounds, as an example, we may choose the musical alphabet, those which may be transcribed in any language according to its own habitual phonetic transcription but which, when pronounced, have a sound common to all people, both when uttered and when heard and which contain the same concept as transmitted by the emitter and as received by the listener. In certain other onomatopoeic sounds which we could choose, there may be discrepancies between one country and another, but we believe that these would not be difficult to unify.

With this syllabic concept we know that we have the possibility of extending the language and in order to do so, we would have to

increase the number of syllables which compose it, the syllabary. This might constitute an advantage as we could apply this to the establishment of the language levels, from the elementary level with very few syllables, up to the maximum development of the language.

In normal languages, the brain does not pay much attention to the pronunciation of words since it knows that these will generally be understood by normal listeners, even taking into account the habitual variations. Thus, when speaking to a child or to a foreigner, one pays much more attention to pronunciation and this happens too with onomatopoeic sounds or with musical notes, since the brain knows in these cases that what is being transmitted is a sound and it therefore has to be perfect.

### **6.3. Spectral Discrimination**

Another of the more important points of this project is to ensure that this language be used to communicate with computers and that these, in turn, act as a link to communicate with other people.

At the present time it well known that technicians encounter enormous difficulties in designing voice recognition systems for use by a large number of people, due to the similarities in the tone, pitch intensity and duration of the voice and the spectral similarity of certain phonemes in such a way that in a single phrase different syllables pronounced by different speakers may be indistinguishable.

We might solve this problem if, when selecting the syllables which will make up the nucleus of the new language, we make sure that they are sufficiently differentiated in the auditory spectrum for a computer not to have any problems.

It is inevitable that these differences in tone, pitch, intensity and duration among people are also expressed in the sounds chosen which, within their parameters and differentiation, will mean the computer is able to discriminate between them.

There are phonemes, such as the "s" which are well differenti-

ated from other sounds on the spectrum. This set of phonemes will be used as word endings, as in the plural, the singular and so on. In this way the problem of segmentation of words faced by voice recognition applications will be removed to a great extent. These are the characteristics which we shall go looking for when designing the proposed language.

#### 6.4. Levels Of Difficulty

A very important point to be considered in its possible implementation in order to make it easy to learn, is to design the language with levels of difficulty in such a way that the it is consistent in its lowest level, although, logically, with fewer possibilities for expression. What this level may be useful for is as the basis of a specialised "sub-language", above all for computer applications.

Among the levels we propose, we would include the following (3):

##### (3) a. Machine Level

A reduced set of very stable sounds, which would constitute the basic language and which would serve as a way of communicating with machines. Both in lexicon and grammar, it should be basic and limited, just the barely necessary to complete communication tasks with machines and to establish programming languages and operating systems.

##### b. Conversation Level

The group of sounds and the vocabulary should be sufficiently widened in order to establish a simple transactional conversation, to travel and do business.

At this level it will be necessary to introduce concepts into the grammar in order to establish elementary conversations.

##### c. Sentimental Level

At this level we should be able to communicate feelings, artistic compositions and the like.

d. Philosophical Level

The most complex expression of the language, comparable to a natural language.

We think that the spread of the language at the machine level will be very fast, above all if we can offer the advantages which software and hardware manufacturers are awaiting, especially for use in applications related to the language industry, those used for translation, voice recognition and syntactic and semantic analysis.

When establishing the levels of difficulty, we are not offering a structure, nor a new concept of the language but we are organising concepts which already exist in a different manner.

## 6.5. Writing

We all know that language and writing are two distinct systems; the only reason for the latter to exist is in order to represent the former and this allows us to consider writing as the graphic image of words (Gelb 1952). This has led us to consider a very simple solution to writing whereby each existing language can chose its own written form of the words that make up this new language.

We cannot forget the relative importance of writing in the language process since the graphic representations of words have an impact upon us as permanent, solid objects and are therefore better suited than sounds to constituting the unity of the language over time. Furthermore, for most people, visual impressions are stronger and longer-lasting than acoustic impressions. Nevertheless, the principal way of language learning has traditionally been through writing, from books, dictionaries, grammar manuals and so on.

For all these reasons, we believe that the solution chosen will offer us important advantages when implanting this new language, because the spelling is well-known and we shall not have to face the prospect of writing with a new schema, as occurs, for example with

a Spanish person learning English who would have to bear in mind that the sound is different from the written form. Far from that, there is no doubt that we avoid half the potential problems by not having to learn the written forms. A standard written form will be established, although it would not be obligatory nor widely-used. However, if an international organisation released a publication, this is the form it would be written in and it would be accompanied by a diskette to facilitate an automatic translation. It is related and thus, it would be learnt.

## **6.6. Development/Strategies**

One of the key areas of the project and the fundamental idea contained therein is the functional methodology which we intend to perfect to develop the project and which has its basis in a philosophy based in some aspects as a free Patent rights for everybody, as long as authorship were cited. So the project requires that its creation does not promote any particular person, nor country but is rather an experiment in cooperation between a closely-knit group of citizens of the world. There is no doubt that is perfectly possible right now, thanks to the Internet. And equally thanks to the creation of a permanent group of researchers and consultants who would set the bases for development, this stage being prior to its release on to the 'net. The same group would later be involved in co-ordinating research. It would be an interdisciplinary team of collaborators from different countries who, through the Internet, would try and promote the spontaneous generation of the language core through the web. This group may be altruistic in nature, made up of groups from companies, universities, organisms, individuals and so on. Our intention is that the Internet itself acts as a regulatory body, defining words and rules of grammar in order to establish its implantation, in the same way as occurs with programming languages such as JAVA or operative systems such as LINUX. It would not be possible for a

single person to develop a common language since it is necessary to discuss different points of view and needs both at a national level (the customs and peculiarities of each native language) and at a technical level (every sector has its own problems: computer technicians, archivists, engineers each have different needs).

Another possible approach to make it more easily accepted would be to have it considered as an auxiliary language, a sub-language to our mother tongue just as we might consider now legal or medical terminology. Given the immense variety of disciplines which will take part in the development of this project (Linguists, Record-keepers, Physicists, Computer Experts, Engineers, Psychologists, among them), it will be necessary to divide it into sub-projects, working independently. These will be defined by their co-ordination towards a final objective. Among these sub-projects we foresee the following: partial preliminary studies in all areas; studies of the most outstanding constructed languages; phonologic/phonetic analysis of sounds; analysis of voice recognition in order to define the ideal pattern; and, creation of a research group on universal linguistics

## 6.7. Diffusion

Throughout this report there is a continuous idea that one of the most important characteristics of the proposed language must be the ease with which it can be learned. This, undoubtedly, will influence the extent and speed of its spread. To reach this objective we shall have to work on three points: grammar, vocabulary and phonetics. In the grammatical area, it is not difficult to fulfil the objective. We should only have to study the hundreds of examples available in other constructed languages and make use of the advances in linguistics in the last fifty years. For example, it is said that the grammar of Esperanto can be learnt in just one hour. In the lexical area a different problem arises since any new word or root can always be

classified as being difficult or easy and our aim here will be to define a set of rules which will normalise the construction of words. Computer networks should be promoted as the originators of these new words, at least of an important group of them. The phonetic structure will be formed by a set of sounds, universally known beforehand and a smaller set of phonemes which will be selected from those considered as, more or less, linguistically universal. It will therefore be necessary for people to memorise just the group of phonemes and sounds selected to make up the nucleus of the language.

Another very important aspect in the diffusion of the language is the concept that anybody who has started to learn this language will immediately be able to use it to understand people from other nations. In this point, as in others which we have made, it will be computer networks which solve the problem. Previously, when these constructed languages, such as Esperanto, emerged, it was difficult to find a solution to these problems since a person visiting another country would not meet another in the street who knew this same language. Today, however, it is very easy to establish and maintain contacts using the language with thousands of people, based on computer networks. This diffusion and development through networks of computer communication, the INTERNET, supposes that this will act as a sounding board, spreading its use extensively, just as has occurred with other events through the web. As a consequence—and through agreements with the most important software companies, in order to incorporate the language in their operative systems—the diffusion of the language will be completed. For these companies this will undoubtedly be a very attractive proposal since, at present they are obliged to translate their programmes and manuals into a huge number of languages. The language will spread quickly among professionals and users of documentation, since it will possess powerful tools for searching and classifying information. Very cheap voice recognition hardware will

become available which, in turn, will bring voice-controlled subsystems for a great number of machines working in different areas of our lives.

At the advanced stage of investigation a travelling, permanent congress will be created, in countries throughout the world. In as far as the development of the project is concerned, rather than going through two different stages, one of creation and another of dissemination, we are proposing to carry out both simultaneously, in such a way that, at the same time it is being developed, it will also be spread. It will be the very same people who spread the language who incorporate new words and rules.

The degree of difficulty for the language which we propose may be summarised in the following table:

Table 1.

SKILL	DEGREE OF DIFFICULTY
Lexical	Normal
Phonetic	Not Learnt
Grammatical	Simple
Writing	Not Learnt

It would be premature to establish a plan of action for the diffusion of a project of these characteristics but we would like to make certain proposals clear since these are intimately linked to the philosophy we wish to transmit. A philosophy based upon union, cooperation, universality and fraternity. Of these actions we would mention the following: produce records of songs, with famous singers, in order for the language to begin to become familiar for listeners; try to make many general Web sites include a link to our Web for diffusion and development; implicate NGO's in its diffusion, above all for third world countries; and create a Founder Members' Club of all those people who cooperate in the development with altruistic motives and encourage the members to carry out actions intended to

promote the language, such as in (4):

- (4) a. Learning the language.
- b. Teaching at least one other person how to speak the language.
- c. Creating a new link in the INTERNET, on a web, in a discussion group, etc., or in an alternative forum.
- d. Participate in the development, in surveys, with contributions, new words and so on.

## 7. Advantages

With the design that we propose, the ease of communication with computers is quite clear since they would include simple Hardware/Software systems to interpret and translate the commands given in this language.

It will allow us to build microprocessors and auxiliary systems based on them, capable of recognising this language and applying it to any machine in our environment in order to communicate with it by voice.

The attempt to establish a programming language and operative system based on the proposed universal language would give information technology a new, more general, normalised focus. It would serve to eliminate somewhat the current commercial dependence as well as to generate and facilitate the learning process since programming languages and operative systems are intrinsically based on human languages.

We all know the difficulties present in the current situation of massive amounts of information stored in computers and the inefficiency of search and classification strategies. With a language in which this concept has been taken into account when designing its grammar, this problem would be greatly reduced.

One of the most singular advantages we might get is to create a powerful communication tool for groups of the physically disadvantaged for their full integration. The visually-disadvantaged would be able to communicate with machines using the voice, thus solving the problem of writing, reading and the manipulation of machines. For those with hearing problems computers could be developed which listen to the surroundings and give them a representative visual display of what is being communicated.

The great internationalist and altruistic focus which pervades the idea would provide this language with great possibilities of spreading throughout different peoples.

Another interesting aspect to contemplate is the way in which we intend to resolve a very complex problem as is the creation of a language from a complex starting point through the web with the participation of thousands of people. This joint act of creation is contrary to previous experiences of creating a constructed language, the tackling of a very complex challenge, from a personal standpoint.

If the language is to be considered as "alive", it will tend to evolve and to break up into a multitude of dialects over a short period of time given the diversity of environments in which it will be spoken although we consider that this feature will be of minimum importance for various factors (5):

- (5) a. A type of "Academy" could be established on the network, composed of a group of experts who could watch over its evolution in virtually real time.
- b. Much of the success of its implantation is based on the fact that it will be used as an interface for use with machines. These, of course, do not possess the capacity to adapt to spontaneous modifications which may be introduced and so that these would in fact be prevented.

One of the inconveniences which we may come across is that, to

begin with, the language may be seen as difficult and strange, perhaps even very artificial. This occurs in nearly all cases when managing a language which does not belong to the same linguistic family and about which we have no prior knowledge. We think that this problem will be overcome once the first stage of diffusion is complete, when we shall begin to hear certain words and expressions in the media.

The language teaching business, publishers, schools, colleges and so on, today a very powerful economic lobby, will, no doubt, raise objections to an initiative of these characteristics. It is not in vain that English language teaching is considered to be the principal sector of economic activity in England.

A more exact classification can be made of certain groups of objects, which differ from one language to another, for example colours. Furthermore, in cases such as this one, rigorous scientific criteria may be applied to the classification. This is in contrast to the original incorporation of these classifications into languages where these scientific criteria did not exist.

Establishing different levels of difficulty and of application will mean that different groups of people will make their own use for their own particular interests (for example, the physically challenged, technicians and others), and this will favour a much faster diffusion.

At present new computer programming languages are being designed constantly, each influenced by the language of the country where it is being developed. If this proposed language existed it would surely be used by these technicians as the basis of their work.

The idea of considering the development of the language with a very large interdisciplinary team through the web is today, perhaps the only possibility, since in other periods the concept of the "pioneer" was the only possibility. However, society and its needs are so complex that today, this latter concept would be quite unfeasible. A century ago, the Wright brothers designed, built, tested and piloted

an aeroplane. Nowadays the same task would require thousands of people working at each of the aforementioned phases.

## 8. Conclusion

We believe that the proposed topic is of enormous importance given the shape of things today. The proposals made for the construction of a new universal language suggest new, advantageous solutions with a focus quite different from those constructed languages we have seen up to now. We have taken into account a new factor, with great repercussions for the future: person to machine communication which has arisen recently. Furthermore, we believe that it is essential to take advantage, as part this development, of the successes and experiences of other constructed languages, above all, Esperanto.

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