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TRANSLATING IN CYBERSPACE: THE COMING INDUSTRY OF TELETRANSLATION

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This paper examines the implications on translation services of the exploding use of new telecommunications technologies, with particular emphasis on computer communications in cyberspace, represented by the Internet. The relationship between language translation and cyberspace in an advanced information society is explored to show that the new communications environment is both creating demand for translation and helping to meet that demand. The paper concludes that the symbiosis between translation service and the emerging communications environment could culminate in "a teletranslation service" as an International Value-Added Network Service (IVANS) with worldwide accessibility using networked translators to best meet growing demand.

INTRODUCTION

If we describe the 1980s as the age of computing, the 1990s must be the age of global networking. This has been made possible as a result of the merging of computers and telecommunications technologies which already allow us to communicate using voice, text or image in real-time or non real-time irrespective of location. Today computers not only form an integral part of all modern telecommunications systems, providing the "intelligence" required to connect people on demand, they are increasingly "customers" of telecommunications too, using the networks to link up with other computers in diverse geographical locations. The interlinked computers enable information of any type to be carried almost instantaneously in the form of digital signals over great distances and create the world of "cyberspace", a term initially coined by William Gibson in his novel *Neuromancer*. The importance of this communications space to the translation industry has been reflected in the growing number of recent papers presented at the "Translating and The Computer" series of conferences with a focus on telecommunications aspects.

The applications of cyberspace are many and varied. They include, for example, the communications created by airline, hotel and rental car reservation systems which enable international travel arrangements to be made from a travel agent's terminal anywhere in the world. In cyberspace there are virtual libraries of millions of volumes and many thousands of research papers being utilized by people the world over. While tele-learning is revolutionizing traditional learning systems, the growing use of personal computers at home is popularizing electronic services such as bulletin board systems (BBS), home banking, electronic mail (e-mail) and teleshopping. In short, cyberspace is providing the channel for a huge range of information exchange required by industry, governments and, increasingly, by private individuals. Furthermore, the merging of computers with telecommunications has led to an increasingly porous and interlinked world.

On the surface, these trends suggest a breaking down of national barriers and an ongoing reduction and perhaps the eventual elimination of impediments to global communication. The reality, however, is not so straightforward. The new information superhighways are opening the way to an enormous volume of cross-cultural communication and as a result they are inviting a variety of potential language problems in the process. While an American businessman can carry in his briefcase a notebook computer and a cellular phone, and convert a hotel room into a virtual office, he is totally helpless when modern telecommunications brings his Saudi client on the other end of the line, speaking Arabic, or when his urgent fax in English sent to China fails to produce results. A New Zealand doctoral student may use the Internet e-mail service to request information from a Japanese researcher, only to find that her counterpart does not understand English. It seems that in the past the difficulty of gaining communications access almost overrode the issue of language problems. Although the actual language barrier is no greater now than before, the perceived barrier is, because of the ease of communication access afforded by advancement of communications technology, as illustrated by Figure 1. Ironically, now that the technical problems are being solved the real problem of communication is emerging, and it is immense. The users of sophisticated communications links will be increasingly exposed to foreign languages and cultures.

The following discussion is based on a research project I have recently completed for the New Zealand telecommunications industry and has a focal point of how telecommunications can be used to resolve language barriers. In the wake of the sudden prominence of the information superhighway with the exponential growth of the Internet, translators as information and communications workers clearly cannot afford to ignore this emerging new communications environment.

THE LINKAGE BETWEEN LANGUAGE SERVICES AND CYBERSPACE

A significant volume of new demand for language services is likely to arise directly from the enhanced capabilities for connectivity offered by modern telecommunications. By their particular nature, certain telecommunications-based services are inherently likely to create their own demand for language services. In other words, while new communications services aim to make people and information more accessible they also make language barriers between the communicating parties more prominent. Communications services of this type are summarized in Table 1, where they are classified according to the type of language service demand that may arise.

Although the table makes a distinction between voice-based and text-based services, increasing media convergence is tending to blur this demarcation from a telecommunications service viewpoint. Nevertheless, interpreting and translation skills are somewhat different, so the distinction is still meaningful for the language service provider and for the purpose of this paper the latter is focused on.

Tele-Conferences (Audio and Video Conferences)

Audio and video tele-conferencing are now supplementing and in some cases taking the place of physical meetings, as falling telecommunications charges lead to cost advantages compared with travel and accommodation. Whenever

tele-conferences cross language boundaries the services of interpreters and often translators as well will be required, and these could be provided in a variety of different ways. Conferences can create a demand for enormous amounts of text translation as well as interpreting services since participants typically need to exchange copies of their contributions, presentations and reports in written form. Today, fax machines and sometimes electronic whiteboards with fax transmission capabilities supplement tele-conference audio and video links to carry the associated papers, and wherever multiple languages are involved, translators are required.

Future conferences are expected to be multi-media affairs with each participant using a networked desktop computer terminal with text, voice and image channels all combined. Presenting a "paper" will involve displaying text, diagrams and pictures on participants' terminals while simultaneously giving an oral explanation, and participants will be able to respond via the same media. In addition to simultaneous interpreting of the discussion, there will be an expectation that text will be delivered immediately to each participant's terminal in the language of their choice. In the past, conference participants accepted that requirements for translation necessitated their supplying advance copies of papers, and that translated copies of final reports may not appear until weeks after the end of the meeting. This is no longer acceptable in the faster time-frames of today's and tomorrow's tele-conferences. Translation services will have to find ways of combining human and machine resources to reduce turn-around times for their products to a minimum, and to link their communications channels directly into those used by conference participants.

E-Mail, Bulletin Boards & Database Access

The practice of gathering information from databases accessed via dial-up computer networks is growing steadily, especially in the academic and business sectors. A huge range and depth of publicly accessible information is available, and by subscribing to electronic networks which have international links via the Internet, for example, information can be easily obtained from all over the world. But databases in foreign countries will inevitably mean the provision of information in languages unfamiliar to the recipient, and today, getting such information translated often means delivering a printed copy to a translation company. Some information providers may anticipate demand and offer their data already translated into a range of languages by building in translation as part of their services. In other cases, however, it will be up to end-users to arrange their own translation.

Similar translation requirements will arise from a range of other branches of computer communications. E-mail and bulletin boards now enable students working on research projects to interact with their counterparts throughout the world, provided they all understand the same language. Or, if you have no time to go out shopping, a growing range of goods can be ordered from your computer terminal for delivery to your home or office. For example, the CompuServe network offers access to some 120 different teleshops, enabling orders to be placed via computer for items ranging from airline seats through books, coffee and contact lenses to real estate, software and stocks and shares - for users who can understand English. The provision of translation services is a prerequisite for the expansion of these forms of communications across language barriers. A significant proportion of computer-to-computer communication of this type does not demand real-time translation; some delay in processing text can be accepted. But some activities, such as the real-

time chat mode, can involve immediate interaction - written conversations in effect - and for these to take place across a language barrier it will be necessary to have a translator - human or machine - in the pipeline between the communicating parties operating in real-time.

Translators will find an e-mail address as essential to doing business in the next decade as a fax number is today. But to make maximum use of e-mail and to facilitate the smooth flow of information through the text production process will require the issue of incompatible encoding schemes for electronic transmission of non-Roman scripts to be addressed at an engineering level. This issue is touched on later with a closer examination of e-mail.

Specialized Terminals

There is a growing trend towards the use of terminals in public places to provide specialized information and allow transactions to be made on a casual basis. For example, 50 "information kiosk" interactive terminals are being installed in malls, grocery stores, etc. in Texas, USA, to provide such information as details of government jobs, unemployment assistance, etc. in both English and Spanish (1). Other examples include: tourist guides which display accommodation, restaurant and transport information; airline and rail timetable displays with the capability of making reservations and issuing tickets; automatic bank tellers which allow customers to query bank accounts and to transfer, deposit and withdraw money.

Suppliers of these systems need to give consideration to the language needs of their anticipated users. These systems are potential sources of language demand, as they all require the user to be able to interact with the terminal using the language displayed and they are all especially likely to be used by tourists. There is some evidence that language needs are already being addressed, as my husband discovered recently when attempting to extract money from an automatic teller machine in Hong Kong using his New Zealand credit card. Faced with a screen full of instructions in Chinese, he hoped he would be able to guess his way through the process successfully. To his relief, when he inserted his card, all instructions changed to English! Obviously the system is programmed to recognize the card's origin and to respond in a suitable language. Unfortunately the money machines in New Zealand are not yet offering the equivalent service for Chinese visitors.

Because these services follow a predetermined format, text in a given language can generally be stored at the terminals themselves, as in the case of the Texas information kiosk terminals. When services provide interactive responses between users and remote databases they need to be connected to the supplier of an appropriate language skill, human or machine, as required by users, to respond to ad hoc situations. There is no doubt that more user-friendly voice-activated systems will become available in the coming decade.

Other Telecommunications-based Services

The marriage between computers and telecommunications is having an impact in a number of other areas with possible language implications. Education, for example, is a major growth market. Tele-learning allows peer students to interact at a distance and enables individuals to receive instruction from

experts in a given field irrespective of location. To be truly international, education provided in this manner will require language services in the communications channel between teachers and students. Entertainment is another potential market for language services, particularly as interactive TV and on-demand video become readily available. We may soon be thinking in terms of hundreds of TV channels to choose from instead of a dozen, and this will certainly include foreign language content. Calling up a foreign film which can be dubbed or subtitled on demand in your language may be possible.

Thanks to telecommunications, the publishing industry now has the possibility of electronic distribution of text and graphics. Already we can read the latest Stephen King novel on Internet ahead of the printed copy, and books can be downloaded to our PCs to read on-screen or print out, as we prefer. Such on-demand publishing will require translation if it is to access foreign language markets, and teletranslation will provide the solution. Instead of a lengthy delay while you wait for your favourite author's new titles to be translated a few years after the publication in the original language, the translated version could be delivered almost simultaneously with its first release.

HOW TELECOMMUNICATIONS ARE HELPING MEET THE DEMAND FOR TRANSLATION SERVICES

Of course not all new demand for language translation will arise from increased use of telecommunications. But telecommunications technology can still help to meet demand from other sources by providing means to streamline the translation process by linking the information source, translator and information recipient electronically. The key requirements for translation services of short turn-around, high quality and low cost are becoming increasingly difficult and sometimes impossible to satisfy without telecommunications links. For example, use of immediate and efficient electronic links to connect appropriate human and machine (i.e. MT) resources in diverse locations may make it possible to complete a seemingly difficult high volume job in a rare language pair on time. While today's translation services already make good use of fax and modem to connect with customers, and with remote working freelance translators, these links often require ad-hoc arrangements which eventually run up high communications costs and are likely to cause difficulties in coordinating each resource in a coherent manner to deliver quality products.

The past decade has seen several translation services come into being which have been deliberately designed for maximum integration with telecommunications systems. AT&T Language Line, KDD Teleserve and Translatel are subsidiaries of the giant telephone companies AT&T, KDD and France Telecom respectively, designed to exploit the full potential of telecommunications to meet language needs which may themselves have originated in the use of telecommunications. They offer real-time interpreting services via telephone as well as translation services using new facilities such as e-mail. These are the first generation of what I call "teletranslation" services. Falling prices of telecommunications mean that language barriers today can form a much greater discouragement to international communications than does the cost of the communications channel. And computer network service providers are also making translation services available to their subscribers who are increasingly venturing into unfamiliar linguistic territory in search of information or pure entertainment.

Translation services are starting to appear on the menu of many publicly accessible computer networks, including the three major networks in Japan, PC-VAN, NIFTY-Serve and ASCII Net. These networks offer twelve such translation services, half based on human translators (two of which are exclusively for post-editing of translation produced by MT) with the remaining six services based on MT. E-mail is used as a primary medium for all these services for text delivery, complemented by fax. In Europe similar services are offered by Systran (2). Of particular interest in terms of teletranslation is one recently formed company, WORDNET (3). It offers a worldwide translation service via the US based DELPHI Internet Service and also directly via the Internet using a combination of fax, e-mail and data communication. WORDNET employs over 1000 remote working translators and is cited as a successful example of a business which is based on electronic communications technology, linking the customer and the company on the one hand and the company's project managers and its translators on the other. CompuServe, one of the largest on-line service providers in the world, is also introducing an MT-based translation service during this year to specifically cater for the needs of its European customers.

THE EMERGING ELECTRONIC COMMERCE AND THE ROLE OF TELETRANSLATION

The symbiosis between the new communications environment and the translation service seems evident and as a result various teletranslation services are developing. Symbolizing the new communications environment is the exponential growth of the Internet, and the emergence of electronic commerce as an Internet application has particular relevance to the future development of the translation service. For example, a trial version of software can be downloaded from an Internet "site" which can be accessed by any user located anywhere in the world. I found an on-line help service offered via e-mail by an overseas software company cheaper than sending fax messages and much more helpful than "user unfriendly" manuals. Marketing products and distributing services in this way are also effective in terms of reaching a large number of potential customers simultaneously via a single window. WORDNET is another example of taking advantage of this environment.

Internet Applications

The Internet, developed out of the first extensive US computer network ARPANET created in 1968, is now accessible in about 137 countries to users whose numbers have grown from a few thousand to an estimated 25 to 40 million during the last decade. Analysts predict (4) that by 1997 some 120 million users will be on the Internet, which will then be providing an even greater range of services. This world's biggest network of networks carries traffic ranging from personal mail (e-mail), hobbyist bulletin boards (newsgroups) of over 2000 and entertainment services through R&D activities by academic and business sectors to commercial information for marketing and sales. The Internet's growth rate of a million new users every month heralds the dawn of the network-based society. And as such it holds far-reaching implications for the wider community as well as the translation business in particular.

Although the Internet started as a non-commercial research-oriented network and still retains aspects of these original characteristics, the situation is changing rapidly. Today more than half of the Internet traffic is commercial and much of its increasing popularity is of a commercial

nature (5). It is possible to advertise products and also to provide actual services via Internet although advertising in newsgroups is virtually prohibited. In relation to the translation industry, the Internet offers a wide variety of services. For background research purposes, its rich sources of information via various databases is useful while on-line access to multilingual terminology databanks such as EURODICATUM provide a distinctive advantage (6). Translators can order books on-line via teleshopping while quick scanning through the world news may help maintain information on relevant current issues. I can access Japanese newsgroups and view their messages in Japanese. The Internet's software utilities section (7) indicates relevant "sites" from where various software tools can be downloaded, for example, to enable text written in such languages as Chinese, Korean and Japanese to be read. It seems only a matter of time before public-domain PC-based MT software starts to appear in the Internet to help users "surf" around language barriers and access information provided in different languages. Probably the Internet's most utilized and perhaps its most relevant service in relation to the translation business is e-mail.

E-mail: Its Advantages and Remaining Problems.

A significant simplification in the procedures involved in transferring information between two remotely located computers can be achieved if the two remote computers that need to communicate subscribe to an e-mail service. E-mail essentially uses one or more intermediate computers to store the electronic message, or file, until it is convenient for the intended recipient's computer to receive it. E-mail effectively provides a subscriber with an addressable electronic mail box in a host computer network. Other computers can dial up the network and deposit files into the subscriber's mailbox (using appropriate communications software and a modem connected to the telephone network). When convenient, the mailbox subscriber can similarly access his mailbox and download its contents to his own computer. By belonging to an e-mail service, the need to be concerned with matching communications-related parameters required for modem-to-modem communications is removed, as these settings are in general fixed for the subscriber's relationship with the e-mail service. Another convenience offered by e-mail is that the use of an intermediate network enables asynchronous communications between the two end point computers. This means they no longer both need to be linked into the telephone network at the same time in order to exchange text - often difficult to arrange particularly if the communicating parties are in different time zones. The economics of using e-mail versus paying toll bills for direct phone links between computers will of course depend on subscription and usage costs of the e-mail service used and the telephone charge rates for the distance and time involved, but generally, for long distance communications there are cost advantages in using e-mail.

Whether a subscriber to a particular e-mail service can access a given e-mail address in another network will depend on the interconnection arrangements in place between the networks involved. At the time of writing, for example, the Japanese networks NIFTY-Serve and PC-VAN have both recently opened up links to the Internet for their e-mail services. The JUNET (Japan UNIX Network) also has international links. Other commercial e-mail services connected via Internet gateways include X.400 mail servers, CompuServe, America Online, MCI Mail among the best known. This may sound rather primitive in comparison with making an international phone call, but my personal experience indicates that an actual trial is the best way to determine whether communication can be achieved to a particular e-mail

address.

Considering these advantages, e-mail provides an ideal medium for translation service providers to send and receive text, and for posting questions to clients and fellow translators. E-mail can also be used to identify the location of a type of file you may wish to download from various Internet databases. The reply message will contain a listing of all the sites which contain the relevant files and the directories in which the files reside.

There are, however, remaining problems of different character sets and encoding schemes to be overcome before successful communication by e-mail in Japanese and other Asian language text can be achieved. While sending messages in the form of ASCII text will be mostly straightforward, handling of scripts that use non-ASCII encoding schemes can get very complicated. It is possible to send Japanese text via some e-mail networks outside Japan if it has been encoded according to the JIS standard and provided a number of other rules are followed. In some situations, however, Japanese text will be distorted en route (which, for inter-network communication in the English language environment, is essentially designed to carry one-byte, seven-bit ASCII codes) and it will be necessary to use special software tools to modify the text to enable it to be carried transparently (8).

In summary, although truly global and transparent communications awaits resolution of a number of standards and compatibility related issues, the extension of telecommunications to the exchange of written words directly between computers in the form of e-mail is bringing considerable convenience to the translation industry.

CONCLUSION: BRINGING IT ALL TOGETHER

A future translation service must be considered as one component of a highly information and network-oriented society in which all kind of information in electronic form is traded internationally. Such an information society is likely to undergo continuous and rapid development as demonstrated by the rapid proliferation of the use of the Internet during the last few years. As has been argued the language service has a deep affinity with such an environment and indeed has an important role to play in this increasingly interlinked world. The application of e-mail alone suggests how a conventional translation service could expand its market and resources in order to provide worldwide services. The concept of teletranslation is based on the application of structured and efficient global networks to bring language service providers and their customers together in cyberspace while behind the scenes human experts and MT are linked by well designed communications networks. Any information service of today is a potential International Value-Added Network Service (IVANS) in the coming world of widespread electronic commerce. Realization of language service as a form of IVANS calls for a stronger union between today's translation service and the telecommunications industries to bring about its progeny - a teletranslation service.

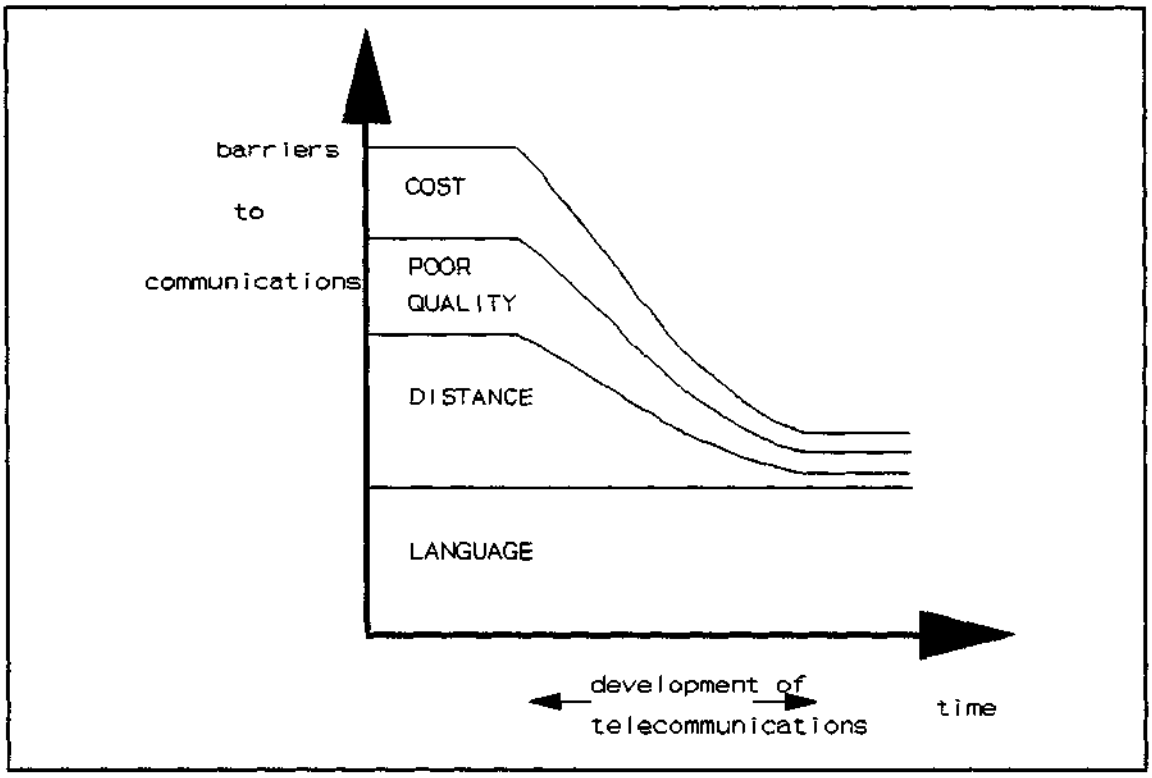

Figure 1
The growing significance of language as a barrier to communications

	REAL-TIME DEMAND	NON REAL-TIME DEMAND
VOICE-BASED DEMAND	audio conference video conference telephone	voice mail audio information Lines (e.g. 900)
TEXT-BASED DEMAND	on-line chat mode audio conference)on-line document video conference) exchange on-line database search specialized terminals	e-mail electronic bulletin board database retrieval

Table 1: New Language Demand Linked to Telecommunications-based Service

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