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The Internet - myth and reality

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So much has been written and discussed about the Internet over the past few years that it is often difficult to know either where to start or what more to say. This paper aims to summarise the major characteristics of the Internet and to look at some of the newer capabilities which are dragging the myths further into reality. The implications for professional translators will be considered throughout.

The Internet

The Internet is often described as a network of networks and this does perhaps serve to emphasise its eclectic growth pattern. Beginning in the 1960s the Internet started out as a project undertaken by US Government agency ARPA (Advanced Research Projects Agency) to develop packing switching networks. These networks were designed to facilitate data communications between computers even if the links between them were unreliable. The idea of packet switching is that the data to be transmitted is divided into small 'packets', which are wrapped up inside other data containing information on the destination address, and the number of the packet in the final sequence of data, among other things. The network computers will try to work out the shortest route from sender to recipient for the packets to take. As this route may vary according to prevailing conditions, the packets may be switched along different routes.

The Internet has essentially three types of component.

- hosts: personal computers, servers and mainframes which run the applications.
- networks: LANs, leased lines and dial-up links which connect the computers
- routers: responsible for directing the data packets over the networks.

Further detail on Internet components can be found in Handley and Crowcroft (1).

Although the initial work was carried out for the US Department of Defence, the networking protocols were also used by researchers working in academic departments. The initial network, ARPANET is considered by many to be the forerunner of the Internet. In 1983, the network divided into interconnected military and academic sections. In the later 1980s, other national and international networks linked in, and the resulting internetwork become known as the Internet.

The networking protocols are what distinguishes the Internet from any other network. A protocol is simply an agreed set of rules - in this case for communications between computers. Any computer connected to the Internet joins in by agreeing to speak the Internet language TCP/IP (Transmission Control Protocol/Internet Protocol). This of course has tremendous implications for exchanging information between different computers - everyone wants to connect to the Internet because it allows communication in a common language with everyone else.

But to go back a little, we need to understand how an early, US academic network found its way into offices and homes all over today's world. A detailed history can be found in Dern (2). After all, the initial applications running via black screens with green or amber characters in courier font were hardly of interest to anyone outside a computer science department. It is likely that developments in three areas combined to lead us to where we are today. First came the rising popularity of the Internet within academic and research circles throughout the US and Europe, simply because it allowed access to other computers, and exchange of

files and electronic mail between like minded individuals. Second, the use of computer networks became more usual throughout the 1980s as local area networks began to replace expensive, centralised host systems and businesses wanted to 'downsize' or 'rightsize', remodelling their computing activities on client workstations, and distributed data servers. Third, technological developments finally allowed computers to handle multimedia - sound and video. To do this we need very fast processors, large amounts of RAM, (Random Access Memory) and vast storage media, all available at a low cost. This first became a possibility around 1987 with the introduction of Intel's 80386 microprocessor which crammed a million transistors onto a silicon chip for a desktop PC. Today PCs contain Pentium Pro processors running at around 200 Mhz and featuring serveral million transistor elements. Laptop computers can offer us over 100 megabytes of RAM and several gigabytes of internal disk storage. The possibilities for real time sound and video are endless as we now have the technology to store and process the large amounts of data needed to provide interesting material to computer screens, capturing everyone's interest.

The increasing use of networks and graphical computer interfaces grabbed the attention of the commercial world at the beginning of the 1990s, as the benefits to business and commerce from improved communications, information access and distribution were too good to ignore. Originally the networks comprising the Internet were paid for by governments for academic and research purposes only, but increasing investment by commercial ventures has opened up the Internet to virtually anyone who is prepared to pay. Commercial traffic is routed over section of the net sponsored by commercial providers, leaving research networks free for their own purposes.

Perhaps the most significant reason for the now massive interest in the Internet is the World Wide Web, Berners-Lee (3). This multimedia, hyperlinked digital data store pulled together advances in multimedia handling and telecommunications to facilitate the provision of information to any user, anywhere on the Internet via an easy to use, graphical interface. Virtually all you need to do is click with the mouse button. This means many more people find accessing information via the Internet interesting and even fun. Especially with the increasing prevalence of sound and video resources.

The World Wide Web began in the Laboratory for Particle Physics (CERN) in Switzerland, where the idea was to create the ideal information environment for the researchers. Based on accessing data via the Internet, each resource was identified by a unique address, also know as a URL (Universal Resource Locator). Documents, which may be in any file format, not just text, are encoded in a language called HTML (HyperText Markup Language). Within a document, they may be links to other documents or resources stored either on the same machine as the original or anywhere on the Internet. Computers which sit on the web holding HTML resources are known as web servers.

Accessing information on the World Wide Web is achieved by using a piece of software on a local machine connected to the Internet. The software is referred to as either a web client or browser. There are several versions of web browsers available for just about any computing platform. Arguably the two most popular clients for personal computers at the time of writing are Microsoft's Internet Explorer and Netscape's Navigator. The whole thing works using the contemporary client/server model, where the local web *clients* access information held on web *servers*. The nice thing is that it is possible to use any client to access any server, so that any information can be accessed via one interface. Client software takes the user's query, connects to the relevant server and passes on the query in a way which the server can understand. The server then passes its response to the query back to the client, which formats the results in a way which is suitable for the machine the user is working from. There are many examples of client/server applications running over networks other than the Internet, but it is true to say that most Internet applications are designed to work in client/server mode.

Another benefit of a web client or browser is that most of them can in fact access other types of Internet servers such as ftp servers, archie servers, gopher servers and news servers. This seamless access to just about anything on the net has also encouraged enthusiasm from all sectors. It's really quite easy to do as all you need is an Internet connection, and a copy of your favourite browser.

Myth and Reality

So is the legendary information superhighway finally with us? Well the Internet still has some way to go before we can all step into computer generated worlds without subscribing to extremely high bandwidth research networks. Many users find the Internet agonisingly slow, even for graphics and coloured text, let alone for video sequences with integrated sound. It's interesting to note how quickly we have ceased to be impressed with the wonders of the web - which is still relatively new. Far from being amazed with the complexities of integrated text and colour images woven together with hyperlinks, most of us demand much more information much more rapidly. It was only in 1993 that information from a web server first crawled onto our screens, and already we want interactive 3D worlds.

There are many areas in which improvements to the speed of information access and delivery are occurring, including an increasing number of network access points, lines and routers. As fast as providers increase their networking capacity though it does seem that more Internet users appear to consume it. In addition, information providers can increase the number of copies of their data by providing mirror sites which can serve a wider population. Technically there have been advances in data compression techniques which allow faster and more reliable delivery of sound and video sequences but these still have problems delivering the TV quality material we are used to over international Internet lines.

The information superhighway, delivering video quality business, education and leisure services to our offices or homes whenever needed is still therefore, a myth. The eventual superhighway may not even be the Internet, and may instead utilise alternative networking technologies such as ATM and B-ISDN to deliver services. There are those who feel that unless some of the many problems are address in the very near future, much of the recent enthusiasm will be lost as users give up watching the 'egg timer'.

Some of the drawbacks encountered with the original TCP/IP protocol are being addressed by the Internet Society - the organisation responsible for overseeing technical development of Internet protocols. It is perhaps interesting to remember that these protocols were not born great, but rather have had greatness thrust upon them - and have consequently needed to be updated and expanded. Security is one area which has attracted a lot of work so that it is gradually becoming acceptable to carry out business and financial transactions via the net. Although at the moment this seems confined to credit transactions, it probably will not be long before direct banking becomes common. The opening up of the Internet for real time financial transactions is regarded by many as being the driving force behind the creation of the information superhighway.

Another issue is that of finding relevant information in this vast web. Many professional users are quickly frustrated by the amount of irrelevant material they encounter, and concerned about not locating information of possible interest. Anyone can publish on the Internet; at the same time both a great strength and a great weakness. Certainly the problems of indexing the information are considerable - finding everything on a network which is still growing exponentially is an impossible task. A year to eighteen months ago I would have agreed with someone who felt that the Internet was still more of an executive toy than a professional tool. However there are now many search engines and directories which lead most users to relevant resources and although searching for information successfully is still a skill, it is no longer impossible and there are few professionals in any field who can ignore network resources. This will be discussed further in a later section.

The reality of the Internet is perhaps somewhere in the middle of all the hype- it's not as good as it could be is but then it's not as bad either.

What Does the Internet Actually Do?
Before the rest of the world joined, the Internet supported three applications: telnet or remote logon, ftp, and email. Although these applications are still used today, their use is very much wrapped up within a graphical environment such as that provided by a web browser, and the whole process of making remote connections, transferring files and sending and receiving electronic mail is quite seamless. As we have already noted, a web browser such as Netscape can carry out remote logon calls, exchange files with ftp servers and handle mail. A more contemporary view of what the Internet does for us could be:

* **communication**
* **retrieval and distribution of information**
* **financial transactions**

Cordon (4) discusses uses of the Internet for translators along these lines. For the sake of completeness however, here is a brief summary of the original features.

Telnet
This is a program which runs on the local machine, often a personal computer, and allows a connection to be made to a remote machine. The user can then access programs and/or data stored on the remote machine, using the local PC as a terminal. Once connected to a remote system, a user will generally be asked to enter an account name and a password, and will then be left at the mercy of the remote operating system, often UNIX. The exceptions to this include most library catalogues, which allow access via telnet. These offer a character-based menu interface to the collections, and include instructions for logging in and out. Another exception is provided by a gateway service, which offers the user a menu of options, often to other network services. Telnet calls can be made from within a web browser however, and use of a standalone program is declining. In addition, data collections previously accessed over the Internet via telnet, such as library catalogues and databases, are being redesigned to permit access via a form based interface running within a web browser.

FTP
FTP or file transfer protocol, is another program which runs on a local machine to provide connection to a remote one. FTP however, supports file exchange between the two machines. Again the user will need an account name and a password, although many public systems allow login with the id anonymous, and will accept a valid email address as a password. Once connected to the remote system, the user has to navigate to the correct directory, and identify the correct file to transfer. Files held on FTP servers may be in any format, and it is up to the user to ensure that an appropriate format is chosen. Many files on FTP servers are compressed to save space and to reduce the amount of time taken to transfer them. These files need to be decompressed on retrieval, using a utility such as PKUNZIP.

Like telnet, ftp is not terribly easy to use, although Windows versions are slightly easier than their command line counterparts. Fortunately, access to FTP servers is easily done using a web browser, involving very little more than some pointing and clicking, and choosing a suitable location on the local drive for file download.
Email
Sending and receiving email is still one of the major joys of joining the Internet. One of the main changes in email programs has been the move away from central systems, where a user logs in to a mainframe to compose, send and read mail using a text-based program, to

PC orientated systems, where incoming mail is sent from the mail server to the user's PC for reading and filing, and the user composes mail to be sent from the local PC. Mail programs running on local machines are now graphical, and in addition have the ability to send and receive multimedia files - ie. binary files as well as straightforward ASCII text.

The Internet for Translators - Communication
There are probably few professionals who have not by now realised the benefits of electronic mail for communicating with colleagues, employers and clients. Less intrusive than a telephone call and much faster than a letter, email easily spans continents and dispenses with any international time barriers. Often undervalued is the ability to exchange files via electronic mail - arguably still the most useful feature for many commercial Internet users. An overview of the benefits of email can be found in Harris (5) and with particular reference to translators in O'Hagan (6).

The usefulness of mailing lists and newsgroups is perhaps worth reiterating. A mailing list runs on a mail server sited anywhere on the Internet. A user joins a mailing list by contacting the mail server, and adding his or her name to the mailing list of interest. The user will subsequently receives a copy of any messages sent to the list into his or her personal mailbox. Anyone with access to a mail server can set up a mailing list, which may be for a closed user group or open to anyone on the Internet. Each mailing list will have a specific topic for postings, and will be aimed at a specific group of individuals.

Newsgroups are a little different: there are thousands of newsgroups containing postings which are copied between newservers all over the Internet. In theory each newserver should hold exactly the same information, but in practice some newservers are selective in the groups they hold. A user elects to 'subscribe' to any particular group by connecting to the nearest newserver (using a web browser or a news reader program) and downloading any new postings. Newsgroups are a bit like bulletin boards - you go there to read them, taking a copy of any relevant information, while mailing lists send stuff directly to your mailbox. Anyone can set up a new newsgroup providing there is enough demand from the usenet news community. Suggestion for new standard newsgroups are posted to the newsgroup news.announce.newgroups. If you are interested in the general workings of usenet, try looking at some of the postings in news.announce.newusers or for those without net access try Pfaffenberger (7).

Mailing lists and newsgroups vary in subject and content - sometimes they are not for the faint hearted! However, some are useful for making professional contacts, for discussing technical issues, current publications, resources and of course, for asking for help.

Finding mailing lists and newsgroups is not straightforward although there are several things that can be done in the quest to identify a relevant resource.

Mailing Lists
Identifying all relevant mailing lists is hard because there is no comprehensive listing. Details of mailing lists available from the UK mailbase server can be found by looking at:

http://www.mailbase.ac.uk

forensic-linguistics and intercultural-communications may be useful lists. To identify others, try the lists at: **http://www.clark.net/pub/listserv/listserv.html** or
http://scwww.u.indiana.edu/mlarchive
Newsgroups
Many newsgroup posting are archived and the group titles included in indexes built by search engines which scan the archives. Try searching the DejaNews search engine for

'translation'. The DejaNews search engine can be found on the Net Search Button of Netscape, or by connecting to:

http://home.netscape.com/escapes/search/usenet.html

You can also try the reference.com search engine, found on the same page which allows searching of both newsgroups and/or mailing lists.

My search found the newsgroup sci.lang.translation. Interestingly a search for the term translator found many references to the Star Trek newsgroups - talking about the extremely useful but so far imaginary, universal translator - the device which allows all those aliens to speak and understand American English…just in case there are any Star Trek fans out there.

Implications
The increasing use of the Internet for communication may be thought to increase perception of the language barrier O'Hagan (6) between individuals and organisations. As network access to people and resources from differing nationalities becomes cheap, easy and commonplace, the number of times foreign language material will be encountered will increase. In some respects this could be thought to increase the need for language skills and translation, but the on the other hand is the simple observation that the language of the Internet at the time of writing does seem to be English, or at least American English. And perhaps this is understandable when one considers that the Internet has its origins in the US. Certainly when browsing sites by geographical location, it is apparent that many countries prefer to disseminate information in English; even in Russia and former Soviet republics one can notice this, where English has only recently become fashionable, and increasingly taught in schools.

One of the drawbacks to producing non English resources for the web has been the inability of many computers to handle text not allocated one of the 256 ASCII codes, including Cyrillic, Chinese and Japanese characters. Much work has been done to overcome this and perhaps the gradual acceptance and use of the UNICODE standard will help to increase the availability of international character sets (8). This will not, however, increase the ability of readers to understand foreign language materials and the demand for a universal language will remain. It is extremely likely that as far as the Internet is concerned, this will be English.

It is hard to imagine however, that the existence of a universal Internet language will obviate the need for translation. The Internet is simply a tool for access to information worldwide, not a panacea. There will still be many instances when translation of conversations and texts are required for those who either cannot understand English, or those who prefer to communicate in their mother tongue. Whether translation will occur via a person or via machine will probably depend on the availability of effective machine translation, and the comparative costs and speed of turn around, but as O'Hagan (6) suggests, the Internet does offer an ideal medium via which to link interpreters and translators with not only their clients, but with many of the resources needed throughout the translation process. In addition, the worldwide reach of Internet services may increase the need for translation of resources with international appeal such as home shopping, travel and leisure information.

The Internet for Translators - Information Access and Distribution
It is hard to imagine what sort of information cannot be found on the Internet in 1996. Likewise is possible to distribute virtually any information you care to imagine via today's telecommunication networks.

We have already discussed the mechanisms of electronic mail and newsgroups for access to and distribution of files, conversations and assistance, but the Internet also offers us several other ways to find and publish or distribute information. By far the most significant are web servers. In general those wishing to publish information about themselves or their organisation will choose to do so in the glossy format of the web, making ample use of multimedia and hyperlinking to ensure that visitors to the web page keep returning.

It is possible to retrieve and distribute files containing any sort of information via ftp or gopher servers, although these methods are with only few exceptions, of largely historic significance. Still, any files sitting on either an ftp or a gopher server can be readily accessed by anyone with a web browser. Files on these types of server have none of the immediate, multimedia appeal of the web, and have to be downloaded and viewed by an appropriate application, although Netscape and Internet Explorer are able to handle many file formats automatically. Nor are there any hyperlinks, thereby reducing the navigational aspect that makes the web so popular. For a more detailed discussion of ftp and gopher servers see Dern (2) and Obenaus (9).

Traditional Library Resources
Access to library catalogues, bibliographic databases, contents services and full text articles is necessary for many professionals, all of whom are beginning to find access via the Internet extremely convenient if not free of charge.

One of the main drawbacks to access to information of this sort has been the multiplicity of interfaces to catalogues and online databases - often requiring the services of an intermediary. One of the recent trends brought about by the impact of the web is the universal interface, ie a way in which the end user can access any bibliographic or full text database via a single interface of choice. Ideally it should be possible to use a web browser to access databases, via a forms interface where the user simply has to fill in the boxes. This sort of interface can readily be applied to most databases, where field matches are typed in, and field limiters selected via pull down menus. It is even possible to predict intelligent search engines which can 'understand' natural language queries - in any language.

Of course for this approach to work, there has to be an underlying standard for information searching and retrieval, which applications must adhere to. In this case the standard is known as z39.50, written by the NISO (National Information Standards Organisation) which is a subset of ANSI (American National Standards Institute). This standard is an applications layer protocol which specifies how search and retrieval applications may be designed to work with distributed databases. The standard is very similar to the ISO's (International Standards Organisation) SR (Search and Retrieve) protocol. In order for the standard to work, suppliers must redesign their database products to work with the z39.39 standard. This of course, requires considerable investment, and as with any standard, functionality may be lost in order to comply with the protocol. Version 3 of z39.50 however, supports many sophisticated database functions, and so recently we have begun to see an increasing number of library catalogues, bibliographic and full text databases which may be accessed via the Internet, adhering to this standard.

Z39.50 compliant programs work as client server network applications. The idea is that the user interacts with a client program running on a local machine. The client may be any one the user feels comfortable with, and it is possible that the same client will run on a variety of computing platforms. The client takes the users request, and after having connected with the desired server program, translates the request into something that the server can understand. The server then queries the database application, and returns the results to the client, which then formats the results appropriately for the local machine. The term server is often used to mean the computer on which a dataset resides, but it is also the term for the program which accesses the data. The alternative to a client server model is one in which a central host is accessed via dumb terminals. The terminals perform no processing

functions as everything is carried out by the host processor via a specific command language.

Many suppliers are now including a z39.50 client program with their databases, as client programs are relatively straightforward to write. Server programs are more complex and the functionality is often added on to an existing database application via a gateway program which acts as a translator between z39.50 clients and the database application.

As the popularity of web browsers continues to increase, suppliers are also providing gateway programs which can translate http, the web protocol, into z39.50, so that users can access datasets via forms called up within a browser.

For the time being however, it is still also possible to access many catalogues and online databases via their original command line interfaces over the Internet. This can be done by making a telnet call to the resource, rather than access via the web protocols.

Access to Applications
The is considerable debate among application designers as to whether or not web technology will replace the considerable number of client server applications which currently exist. What seems likely to happen is that it will become usual to access most applications, via a web interface, either over the public Internet or via private Intranets. This will probably be achieved initially by the construction of gateway interfaces to applications to translate http into a language the application understands. In support of this theory, one can consider that Microsoft have announced that the next version of their desktop interface will allow seamless integration of local and web resources, and that rivals Netscape are developing a version of Navigator aimed at businesses, which will replace the Windows 95 interface, allowing users to boot directly into Netscape to utilise either local or remote resources.

From a translator's perspective, this could include access to machine translation applications and multilingual editors. These applications could be accessed via the network as and when required from any location. It is possible to consider that access may be triggered automatically when a need for translation arises.

Home Pages
Many individuals maintain home pages on the web. These can be used to describe professional activities and past experience, and also to provide personal links to interesting resources that others may wish to use. Several of these can be found within the area of translation work, and some I found are listed in Appendix A. Many home pages act as passive advertisements for a person or organisation and this sort of advertising is now commonplace on the Internet.

University, Regional, National and International Projects
The web has always been the ideal place for researchers to describe their work and progress. Those interested in research in translation related topics can usually find information on the web by searching for the organisation carrying out the work.

Reference Works
Dictionaries, thesauri , and terminology listings are all available on the web, although of course not every language pair is necessarily represented. For the moment, many of these collections are freely available, often being sponsored by government or international organisations such as the EU. One of the most well known multilingual terminology databases on the net is the EU's Eurodicatum. This contains technical and scientific terms as well as contextual phrases. It allows searches limited to certain fields as well as free text searches, Obenaus (8).

Other Resources

Many resources designed specifically for interpreters and translators can be found on the Internet. Some specific address are listed in Appendix A but in general information found includes:

• associations
• computer/language research
• directories of people, agencies and service providers
• conferences and seminars
• educational resources

Finding Resources on the Internet
Many users complain that the Internet may contain vast riches, but that the lack of overall organisation and direction for resources on the net makes attempting to locate specific information similar to pulling the needle from the haystack. Some time ago I feel that this would have bee true, but over the past year much work has been done by a variety of people to classify and index resources on the network. In fact, it is probably true to say that if you are a good information professional in real life you will probably feel quite at home in cyberspace. The point is that the Internet does not yet offer us intelligent agents capable of understanding our exact needs and pulling relevant resources out of the abyss and onto our desktops. The Internet is simply a way via which we can access an infinite number of resources, and of course to succeed we have to have a good idea of the sort of thing we are looking for and perhaps even where we are likely to find it. It is rather a waste of time to search the entire Internet by keywords when what we hope to find is a precise bibliography. It would be more sensible to identify a relevant bibliographic database and to search that.

There is no 'right way' to find relevant resources but I have found the following approach helpful.

• start from a known resource
• ask someone for help
• use an Internet search engine
• use a directory of Internet resources

Start from a known resource
This could be a hard copy resource listing but perhaps more useful for locating Internet resources is a home or link page on the web which contains pointers to a variety of resources. Such pages are usually established by a knowledgeable professional, but of course just because it is published on the Internet is no guarantee of worth or credibility. After a brief search, I came across resources entitled *Internet Resources for Translators* and *The Translators Home Companion Page* both of which offered links to other resources, and could therefore be considered good starting points. The web addresses of these are listed in Appendix A.

In some ways knowing of an existing resource and looking for it on the Internet is another way of starting from a known source.

Asking for help
Never waste time reinventing the wheel - always try to find someone to answer a problem if no familiar resources are known. If immediate colleagues are unable to help this is where Internet newsgroups and mailing lists can be extraordinarily useful. Sometimes the web pages of particular organisations or projects list the email addresses of individuals and who may be of further help in a given field.

Internet search engines

There are many of these, the most significant of which can be found by clicking on the Net Search button within the Netscape Navigator program. Search engines started out as initiatives to locate and index web resources, and they generally worked by habitually trawling the web for new or existing servers, and harvesting the documents found for keywords. The keywords were used to build large indexes which users could search using free text for specific terms. The first attempts were largely led by research students, but today attempts to create indexes to the web and indeed to the rest of the Internet is big business.

Each of the search engines works in a different way, and it is perhaps helpful to consider precisely where an engine takes its terms from. Some engines collect all terms from within all web documents, whereas others select from the title and headings, and others take in author keywords. In addition to indexing methodology, search engines can index different section of the Internet. Some index the just the web but others also index Usenet news archives, and will allow you to specify which environment you wish to search in. Increasingly, we have seen search engines which index animations, program files, and games. The only way to know exactly what a particular engine does is to examine the *help* or *about* options for further information. In general however, the engines are simple to use - just type in keywords or phrases. Of course it can be helpful to read up on the exact syntax required for each search engine if a more complex search is required. Needless to say no two engines return the same hits for the same search. Increaslingly, engines are indexing not only resources from the Internet, but also online databases, reference works and catalogues. Although informed of all relevant hits, the user has to pay for those which come from a commercial source. This is done by either pre-registering, or by entering a credit card number.

Again, although it is probably always worth spending 5-10 minutes testing the results from broad searches, it will help to have some idea of the sort of resource you are hoping to find, and to consider which of the search engines could possibly have indexed resources of possible relevance.

Try using the Alta Vista search engine to search the web for "Internet resources for translators". The quotes are necessary because that is how Alta Vista accepts phrases. This is how I found most of the resources discussed in this paper, and listed in the appendix.

Internet directories
Directories differ from search engines in that they offer the user a hierarchical listing of categories, which can be followed through several sub-categories to actual resources. Whereas a search engine simply harvest terms, some intellectual process (human or machine) has specifically selected certain sites for inclusion in the directory. No totally comprehensive directory of Internet resources exists, perhaps not surprisingly given the number of sites and documents out there, but one of the most far reaching projects is the NetFirst service offered by OCLC. This is an attempt to catalogue significant Internet resources, creating a searchable catalogue in an extended MARC record format which includes the resource URL (Uniform Resource Locator) or address.

The most well know Internet directory is perhaps *Yahoo*, which can also be found via Netscape's Net Search button. An interesting feature of Internet directories is that they are increasingly including a search engine so that the user can search the directory entries for a particular phrase or keyword.

The Future
This paper has concentrated on aspects of the Internet which work now. Inevitably, by this time next year there will be yet more specific applications to discuss. Without looking further than the near future, ie. one to two years, I think it is fair to anticipate increased provision of multimedia services via networks such as the Internet, and a decrease in the need for people to be in a specific place to carry out a given task.

One of the most intriguing developments is the Internet telephone - a concept loved by users and feared by telecommunications providers. Essentially, this allows someone using a computer connected to the Internet and equipped with sound capabilities to hold a conversation in real-time with another Internet user. At the moment, such procedures are possible but dependent on users running the same software. Again it is an issue of standards and whether communications software providers wish to further the market by agreeing to abide by a particular protocol. Essentially, thought, users stand to gain by being able to make calls to anyone in the world for the price of the connection to the Internet provider, usually a local call. While most people seem to be resistant to the idea of video telephones, which have been available for some time, the addition of telephone services to the list of tasks performed by a PC seems certain to be received with enthusiasm. For one thing this means less equipment on the desktop, allowing vocal communication to integrate with data transfer.

It is also possible to include a video link, although this is slightly less familiar to people than the concept of a simple audio conversation. The price of digital cameras is falling steadily and it will not be long before cost ceases to be a barrier to video communications. This can be thought of in two ways, firstly one to one or desktop, communication via PCs to allow interaction between colleagues and clients, and secondly, larger scale video conferencing between larger groups of people, perhaps instead of a meeting or even international conference. These activities are all possible today, but are usually arranged by companies using high bandwidth links. In time, we may see such services available to individuals by dial-up or ISDN Internet connections.

Developments in communications will be relevant to all professionals, not just translators but it is easy to see how O'Hagan's (6) prediction of teletranslation services, especially with regard to audio/video conferencing are very realistic.

We can also expect developments in artificial intelligence, supporting such functions as automatic translation of documents and resources, and even agents which function as intelligent intermediaries by understanding natural language queries. Much has been written about virtual reality, and it seems that most working environments can be rendered in 3D on a computing screen. We may all get to stay at home yet!

The future then is bright if not entirely clear. One final observation that stands out from previous writings on the use of the Internet is that there are very real resources available now, and that professionals involved in interpreting and translation are already not only aware of the Internet, but actively using its wires and resources on a daily basis.

Appendix A - Some Internet Resources for Translators

The following is a sample listing I found when searching for resources. I have not followed all of the links so I cannot guarantee that all resources are still there.

Internet Resources for Translators
http://www.xs4all.nl/~mderaaij/english.html

Translation Links
http://dm2.uibk.ac.at/c/c6/c613/tranlink.html
http://info.uibk.ac.at/c/c6/c613/tranlink.html

Einat Frishman's Bookmarks
http://chemphys.weizmann.ac.il/~cfeinat/languages.html

Languages: Human, Computer, Government
http://www.nwlink.com:88/~njones

California Court Interpreters Association
http://www.ccia.org/transl.htm

Natural Languages and Computers
http://hills.ccsf.cc.ca.us:9878/~acatta01

LOGOS selected links to other linguistic resources (sorted by country)
http://www.logos.it/linkto.html

 LIS - Translation Studies
http://www.surrey.ac.uk/LIS/PTS/transtd.html

Private Library - Languages
http://proton.is.s.u-tokyo.ac.jp/~nishida/languages.html

The Translators Home Companion Page
http://www.rahul.net/lai/companion.html

The World Wide Web Virtual Library: Languages
http://www.willamette.edu/~tjones/languages/WWW_Virtual_Library_Language.html

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