Lernout & Hauspie
- determined to be the no. 1

by
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The company strategy of the multinational language technology company Lernout & Hauspie - which has its world headquarters at Ieper (Ypres), Belgium - is a simple one. The company aims to be the no. 1 in speech processing, machine translation, and human translation. And to achieve this increase in market share by research and development, by maximising their resources through closer integration, or by acquisition.

Lernout & Hauspie is constantly in the news (as every monthly issue of *Language Today* testifies) whether releasing another advanced speech processing product, or acquiring yet another translation company. Their expansion is dizzying in its speed. The imminent launch of the multilingual Coronado search engine on the Internet will help make what has been a predominantly English-language medium into one that can be searched and accessed by those without a knowledge of English.
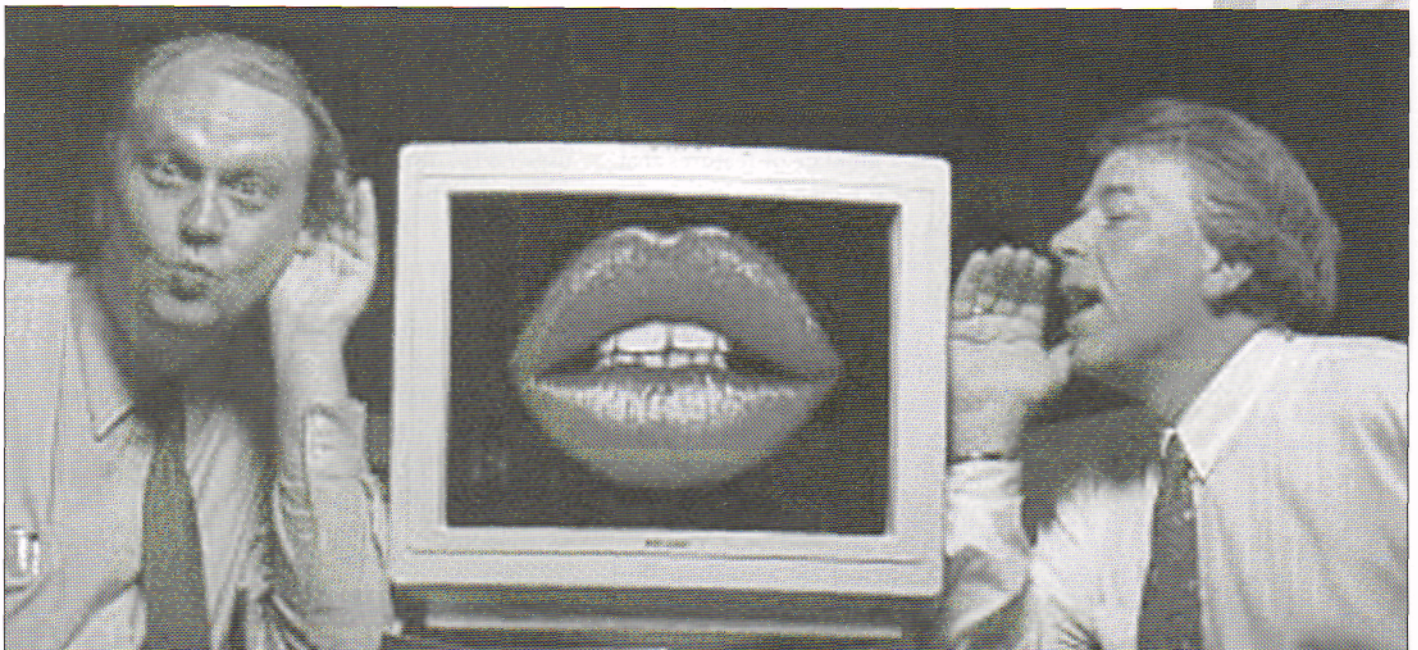
Obviously it was time for *Language Today* to get an overview for our readers of where this high profile company was coming from, and more importantly, where it is going. And so in late April I found myself in one of their newest offices in Wemmel, north of Brussels, to see demonstrations of some of their latest products, to discuss their translation (human and machine) strategies, and to meet company co-founder Jo Lernout.

During the last ten years Lernout & Hauspie Speech Products has made itself an international leader in the development of advanced speech technology for various commercial applications and products. The company is now divided into four product divisions: the Speech (Core) Technologies Division, focusing on Automatic Speech Recognition (ASR), Text-to-Speech (TTS) and Digital Speech Compression technologies; the Dictation Division, dedicated to building a dictation engine for continuous speech applications; the Translation Services Division, supplying a high quality text-to-text translation service, which can be done via translators, machines or a combination of both; and the Internet Services Division, providing automated language translation services for Web-pages and Internet search operations.

In September 1997 L&H and Microsoft formed a strategic alliance designed to accelerate development of the next generation of voice-

enabled computing on the Microsoft Windows platform. As part of the alliance, L&H are developing applications for currently available and future versions of Microsoft's speech application programming interface (SAPI). The alliance is expected to accelerate development of voice-enabled computing that goes beyond today's speech dictation products.

In October 1997, L&H also announced an agreement with MedQuist, Inc. to fully integrate the company's product lines. The resulting clinical reporting and transcription product will benefit health care providers by addressing their specialised reporting needs. This announcement, along with recently announced continuous dictation clinical products from L&H, demonstrates the company's continuing commitment to providing advanced vertical market solutions.

Coronado - the first multilingual search, summarisation and translation service

One of the latest breakthroughs from Lernout & Hauspie will provide industry's first multilingual Internet search summarisation and on-line document translation service, Coronado. Coronado - I was shown an impressive demonstration - is an intelligent search and translation interface that delivers web documents in multiple languages. It is still being beta-tested, but this summer it is scheduled to go on-line, providing translation for English, German, Spanish, and French languages. Future versions will offer support for Chinese, Dutch, Italian, Japanese and Portuguese.

According to L&H, the product will be most attractive to large businesses, academic institutions and researchers, and regular Internet users whose first language is not English, or who are involved in global markets.

"The idea of Coronado is not to have a perfect translation, but like everything on the Internet to provide something which is fast", I was told: "The business potential is enormous".

Coronado provides a number of features that will, in my opinion, give it a unique position among Internet search services. For a start, Coronado does not require search queries to be entered in English. Instead, users enter a query in any of the Coronado-supported languages. The query is then translated and the search conducted across all selected Internet search resources in all supported languages. Before search results are returned they are translated into the language that was used for the query. As a result, users need no knowledge of languages other than their own, and they receive a broad range of results based on a multilingual search.

Coronado's translation process is different from that used by some of its competitors, which appear to translate searches word by word. Coronado translates searches linguistically, using the same sophisticated language models found in L&H's phonetic engines.

Coronado's searches are also more comprehensive because the service fully leverages the Internet's search capabilities. Coronado ships with support for 35 different Internet search engines or indexes. Use of multiple search engines, combined with Coronado's ability to conduct a single search in multiple languages, significantly increases the amount of relevant information returned to the user.

The quality of the translation produced by Coronado can be further refined by the use of specialist dictionaries. By using the topic-specific knowledge found in these dictionaries, the translation takes into account the given context, resulting in a higher readability level.

Coronado downloads Web documents found during a search and then summarises them into three or four key sentences. These key sentences are then translated into the language used for the query. Users may scan through the summaries, select the documents of interest and then simply click on a button to submit those documents for complete machine translation. Coronado connects to a server that utilises L&H's GMS T1 machine translation software to translate documents. It supports a wide range of documents and languages, allowing users to submit for translation Web queries, summaries, and even word processing documents in ASCII, RTF or HTML format. Because no-one is pretending that machine translation provides anything other than a rough translation, users who want a more accurate or more idiomatic rendering may simply click on the human translation icon to have the document further translated.

The human translation services are offered online and, just as the machine translation service uses L&H's own system, so the human translation service will bring into play the expertise of Lernout & Hauspie's Mendez translation group. Already Mendez have allocated project management resources to this task, and eventually these resources will be available 24 hours a day.

Coronado also helps users manage content by ranking results according to relevancy and then organising and storing them in folders (or categories). This process allows users to quickly find the information they are looking for. With Coronado's ground-breaking Task Manager function, users may schedule pre-defined searches to be automatically and regularly updated and translated. When the user next launches Coronado,

any outstanding translation jobs will be automatically downloaded from the Coronado Internet server.

The clear lines of L&H long-term strategy - leverage of techniques and integration to drive expansion forward

So what we are beginning to see is the clear lines of L&H long-term strategy, which is to use the acquisitions of recent years in its future products, "more and more leverage of techniques", public relations officer Jos Verniest explained to me, and for this integration to drive forward future expansion.

It was only last year that L&H announced that it had acquired (for approximately $14.7 million) all of the stock of GMS (Gesellschaft für Multilinguale System GmbH), a Munich-based machine translation service provider. GMS had been founded in Berlin at the beginning of 1993 with 11 employees. It later moved to Munich and by the time of the acquisition by L&H its staff had grown to 55 employees.

L&H chose to acquire GMS in large part because its technology, T1, is based on a well-known, highly reputable, robust machine translation technology platform derived from the pioneering METAL system. T1 provides the same linguistic expertise found in METAL but is better-suited for the Internet/intranet and a variety of other platforms because GMS had re-written it in C++ to run on Windows NT and Windows 95.

When L&H decided to go into text-to-text translation, or human translation, it acquired one of Europe's major translation companies, Mendez Language & Technology. Mendez had been founded in Brussels in 1971 and quickly became the market leader in Belgium. Today, under the L&H umbrella, because of its own expansion and because of acquisitions, Mendez Language & Technology ranks as one of the three largest translation companies in the world. Among the acquisitions (reported at the time in *Language Today*) have been Translingua Language & Technology, Bonn, one of the major companies in Germany, which had been established in 1978, and had a subsidiary LinguaTrans of America, Inc., based in Redmond, Washington. Another acquisition was Lexitrans Language & Technology, the parent company of a group that is the market leader in the Iberian peninsula, made up of Lexitrans SA and LX-Multimedia SL in Madrid, with their subsidiary NewLexi USA Inc. based in Fort Lauderdale, Florida. Lexitrans has been operating since 1978.

ASAP Language & Technology, a translation company set up in Milan that had already had a long collaboration with Mendez Translations is now a full-fledged member of the Mendez Group. Madrid company, CL Servicios Lingüísticos, specialising in multilingual terminological projects, was also brought in, as was EMTI (established in 1989), which has offices in Portugal (Lisbon) and Brazil (São Paulo).

Mendez sales manager Luc van Haute told me that the Mendez group was now concentrating on integrating further the recent acquisitions, and extending the ISO 9002 quality assurance certification, which its Brussels headquarters already enjoys, to an office in every country.

The group will continue to use translation tools, such as the Trados translation memory system, where appropriate. An interesting new development which it has noted is that customer companies are starting to send in files processed by Trados.

Jo Lernout, co-chairman

The latest development in the Mendez group is the opening, in March 1998, of an office in the Netherlands. And other developments at L&H are still coming thick and fast.

Anticipated acquisition of Inso Linguistic Software Business Unit will bring in further NLP resources

Also just before my visit there had emerged news of the agreement between L&H and Novell Inc. to purchase Inso Corporation's Linguistic Software Business Unit (subject to certain US government conditions). This agreement is expected to enable L&H to leverage all of Inso's linguistic technology resources, particularly their linguistic engineering expertise, to complement L&H's existing efforts in the development and research of Natural Language Technology (NLT).

Pol Hauspie, co-chairman

"The Novell's Advanced Technology Division and the expected completion of the Inso Corporation's Linguistic Software Business Unit acquisition give us important additional technological expertise and resources required for further development of NLT", according to Gaston Bastiaens, chief executive officer (CEO) of L&H. "We believe accelerated development of NLT will provide intelligent information processing for speech and language-based products and will benefit all of our development efforts, including our machine translation, dictation and dialogue systems."

The purchase price under the agreement to purchase the Inso Corporation's Linguistic

Florita Mendez, head of L&H Mendez Translations

Software Business Unit is approximately $19.5 million. Revenues from Inso's linguistic activities for 1997 are thought to be approximately $13 million with profits above 25%. The Inso business unit is expected to give L&H access to additional linguistic engineering resources and important technologies such as Quest that will benefit its existing products. Inso's Quest software developer's kit is a search and retrieval tool that gives users "best" answers from both structured and unstructured database sources with an "at-a-glance" understanding of the importance and quality of answers returned. L&H would also gain access to a pool of approximately 20 experienced linguists and engineers who will form a dedicated group, the Intelligent Content Management Group, headed up by Rudy Montigny. Mr Montigny will report to Peer van Driesten, President of L&H's Language Technology Division (who had come into L&H with the GMS acquisition).

As a result of this strategic cooperative agreement, L&H plans to combine approximately 25 linguists, software engineers and computational linguists from Novell's Advanced Technology Division (ATD) into its own experienced linguistic engineering staff. Those resources will help L&H expand and refine its own linguistic databases and knowledge bases which serve as base-line

Lernout & Hauspie's Headquarters in Belgium

technology for NLT and are employed in all of L&H's speech and language offerings. The Novell agreement also provides that L&H and Novell intend to give the 10 million-strong user base of Novell's GroupWise access to L&H's machine translation technology which is being developed to provide users with high-quality, efficient translation of text in a variety of languages.

www.lhs.com

AppTek acquisition brings in more MT language pairs

Another recent acquisition was that of Applications Technology Inc. (AppTek), a developer of specialised linguistic software. This will broaden L&H's machine translation capacity by providing it with MT software in language pairs such as English to and from Arabic and English to and from Korean. An English to Chinese language pair is currently under development.

At the end of April L&H announced that they had entered into an agreement with Endeavour Technologies, a UK language and information technology reseller, for Endeavour to be the master distributor of L&H speech recognition products in the UK.

One of L&H's latest offerings is Voice Xpress, which allows you to dictate text and formatting commands to your computer using your natural language. With Voice Xpress speech processing no longer means - talking - into - the - microphone - carefully - separating - one - word - from - another. The much talked-of breakthrough has finally been achieved: recognition of continuous speech.

Peter Huysmans, assistant product manager in the dictation department at L & H Wemmel demonstrated to me the amazing versatility of this astonishingly low priced product - now being tested, the US English version will probably retail at $49 for the normal version and $99 for Voice Xpress Plus. Once it has been trained to recognise your voice, it will turn your dictation into a word processed text, recognising as it does so an extensive range of format commands, "Increase the font size", "Start bold", etc.

Such dialogue systems can obviously be used in a variety of applications, particularly in direct mail services or voice mail handling. One I was shown enables the user to telephone his or her electronic mail box and give instructions to (and receive suggestions from) the computer about the messages the user wants to know about. All is done using normal language: "Make a selection by date" "Give me any messages from Anne" etc.

Voice Xpress for Medicine is the market's first general medical dictation, Natural Language Technology command and control product. The 30,000 word vocabulary of general medical terms allows physicians and clinicians to quickly and easily dictate clinical reports, notes and letters directly into Microsoft® Word 95 or Microsoft Word 97.

In text to speech systems L&H is currently working in some 15 languages. The systems use rule-based analysis to try to make sense of what the machine is reading. The example demonstrated to

me included the deliberately difficult phrase "I want to record a record in NY for $456.12". Using a preprocessor, with a combination of linguistic analysis and statistical analysis techniques, the system chooses the right phonemes and concantenates them together. Using such systems, it will be possible, for example, to telephone one's own computer and get it to read the email messages which have come in.

In speech recognition (speech to text) various techniques are used, particularly statistical analysis of word sequences, and keyword spotting. In the years to come we can expect to see speech recognition incorporated in many embedded devices, such as the microphone in your personal computer, or systems in your car. Speech processing may be used soon to send your voice over the internet.

When the opportunity came to interview Jo Lernout he began by emphasising the importance of integrating all the L&H developments and acquisitions, of making the most of the precious assets which they now have. Their acquisitions had all been part of a conscious strategy.

The long-term goal is what he called the "magic mirror", i.e. the computer which will answer any question you care to put to it. Already at his home he has voice-controlled systems which can, for example, switch on the lights, adjust the room temperature, switch on the television and choose the desired channel. But one day, and in a future not too far distant, we will be able to ask the television what programmes are on, or when a particular type of programme will be on, and ask a computer to find any piece of information. They were working on these links between user and machine.

From 1995 both revenues and investment started to generate the dynamic growth which continues today

Back in the late 1970s and early 1980s Jo Lernout was working for Wang, one of the pioneers of office computers. Even back in 1982 Wang was experimenting with voice systems, and this experience fired Jo Lernout's interest in speech processing. But he also saw that there was a need for systems which could operate multilingually. His old friend and fellow-Belgian, Pol Hauspie, had run his own software company, and in December 1987 the two came together to launch Lernout & Hauspie. There were almost no revenues at first, and indeed until the company went public in December 1995, but the company's basic speech and dictation systems were developed during those years. And from 1995 both revenues and investment started to generate the dynamic

growth which continues today. The number of employees expanded equally rapidly, from 140 in the early days, chiefly concentrated in Belgium, to the current figure of 1,300 worldwide (not counting some 2,000 sub-contractors and close collaborators).

Belgium, Jo Lernout explains, was a happy choice of a country in which to launch a multilingual technology company. Belgium is one of the few countries in the world where, because of its history and geography, foreign languages are considered of prime importance, where all school children are given at least 14 hours of formal language study a week, and this for at least seven successive years. So there was a ready-made resource of professional translators and linguists, and also computer programmers all had a solid background of language study.

The future looks bright for L&H. "All the markets for our technologies are growing together", says Jo Lernout. "There is now enough brute computer power in systems to run our programs. And since computers will not replace humans in the next ten years for most translation work, there is still a good market for human translation services. Here we can expect to grow at least as fast as the market grows. In MT what you will get in ten years' time will be better than it is today. Technical documentation like the user manual for your hifi will be done by machines. That's a given."

"The computer will not be able to write an article", he said, waving an arm at my notebook, "but it will be able to translate that article into Japanese"

In speech processing, having solved the problems of speech recognition, firstly of discontinuous speech, then of continuous speech, the next breakthrough will be to make the speech recognition fully speaker-independent. This will have many long-term applications, particularly in telecommunications, where speech input in one language could then be output in another language. "We are getting very close to this", he said. In the short-term speaker-independent speech recognition was possible with structured conversations, and this again had many applications.

Then the next big breakthrough in computers, he says, will be to teach them to acquire knowledge and to apply the knowledge they have acquired. This may not be achieved in the next ten years, but it will happen some time in the future. ▪

For further information on Lernout & Hauspie see their website, http://www.lhs.com