

# Net brings a common language

## That's especially vital for China

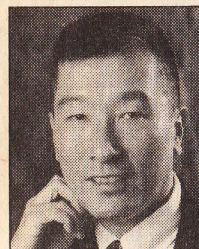
By George Wang

In China, though we have only one written language, we have many spoken ones. It might be hard, in a country of one language like the United States, to realize how much this can impede progress. But to the more than 1.2 billion people of my country — roughly one-fifth of the world's population — this language incompatibility can blunt the success of communication and halt progress.

That's why, to me, the greatest advance of this century is the set of fundamental agreements collectively known as Internet Standards. While not commonly thought of as a "technology," these protocols provide the first real opportunity for people across my country to communicate — to exchange information, to transact business — with each other and the rest of the world, regardless of what language they speak.

For China, this is no luxury. Historically, we have alternated between periods of openness to the outside world and times of prolonged introspection. As a scientist, I know that little progress can be made in a hermetic environment. For us, these agreements on protocol mean access to global technological discourse.

Although "agreements" might sound more akin to the world of diplomacy than technology, these In-



George Wang, 51, became director of IBM China Research Laboratory in Beijing in January. His primary research focus these days is on Chinese language and speech processing and how to apply it to electronic commerce.

ternet Standards have engendered a revolution dwarfing the so-called information revolution. Some of them, such as TCP/IP (Transfer Control Protocol, which governs the sending of packets of information over the global network) date back to work done in the United States in the 1970s as government, academic and military research facilities looked for ways to be linked and share information across an open environment. Others, like the World Wide Web, were developed in Europe in the early 1990s and quickly caught on as a dynamic and exciting way to exchange all types of information.

But significantly, beyond linking computers and computer users, the one language of these standards has prompted a shift away from the computer to the network itself — the Internet — as the focus of attention, a shift that will redefine how we all think of information technology.

This shift is enabling computing to become pervasive — no longer confined to the desktop. For us in China, this means availability of computing

throughout our country in many forms, as various kinds of intelligent devices, transaction systems and entertainment systems are linked to information archives and powerful computing systems.

It also will mean access to computing for people who've never had it, and therefore

fuel China's participation in the e-business revolution that is transforming the global economy.

To illustrate: There are more than 2 million people in China connected to the Internet via traditional computers. But more than 20 million own cell phones and hand-held devices; more than 50 million carry pagers; 70 million families have set-top boxes and cable TV access. Those devices are becoming Web-enabled, bringing these millions on line to buy, sell, learn, conduct business and cause fundamental change in social order.

This, in turn, is driving efforts to overcome an impediment to computing unique to Asia: the keyboard. Since the Chinese language, for instance, requires mastery of some 6,000 written characters for basic communication, a 101-key keyboard is hardly user-friendly for us.

At the IBM China Research Laboratory, we develop speech recognition systems and handwriting recognition systems for Chinese languages, which are being ported to hand-held devices. Suddenly, enter-

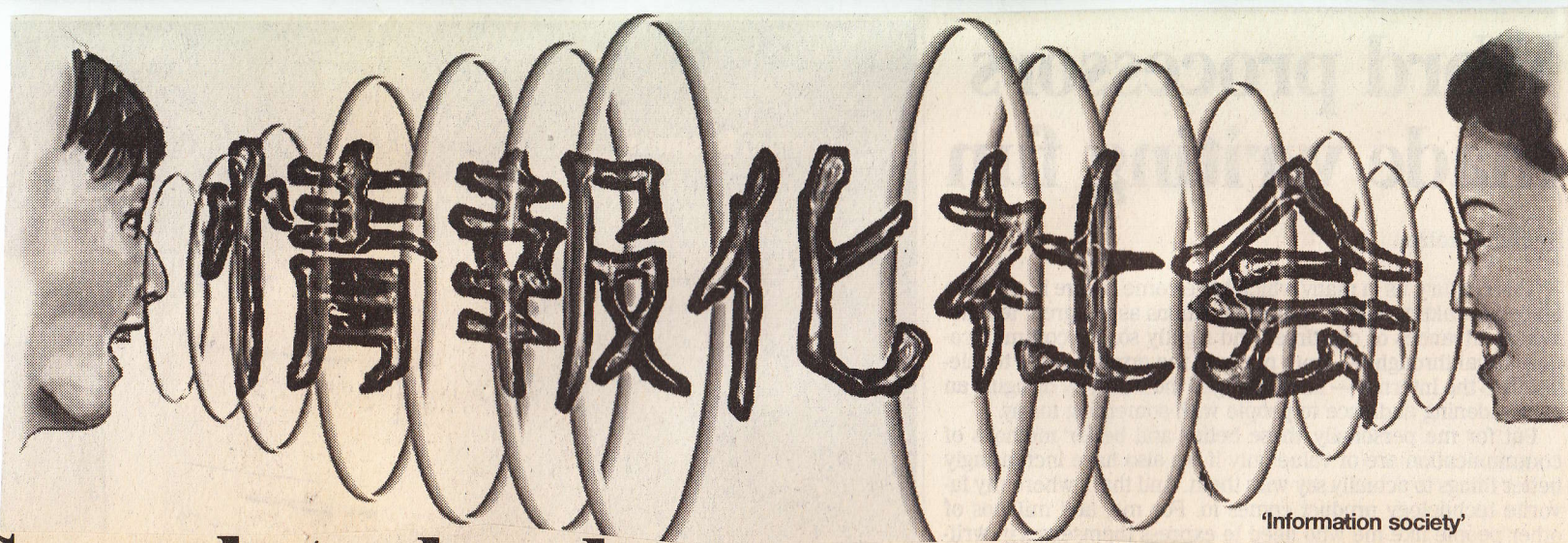
ing information into a computer or accessing information on the Internet is as easy for us as for the rest of the world.

Chinese language search engines we have developed allow us to use our one written language to obtain information easily. We are also working to perfect machine translation programs, since there are potentially billions of users across the globe seeking to access information — and each other — in a variety of tongues.

Throughout history, China has flourished by absorbing and assimilating outside influences and applying them in a uniquely Chinese way. What began as a series of protocol agreements to connect scientific and government computers in the United States and Europe will provide the basis for my country at the very end of the 20th century to leapfrog to technological parity with the rest of the industrialized world.

It will also enable all of us in China to communicate with each other as never before. We have reached, in a sense, a solution to an age-old problem: We will have moved beyond finding just one tongue for China, and instead have found one tongue for the entire world.

► The Net includes the Web and all of the computers linked to it on its networks, plus all systems used to exchange information between computers, including Gopher, Telnet, FTP, WAIS.



# Speech technology can shrink world

But the tools must be easy to use

By Louis Woo

I have been involved in the personal computer industry for more than 15 years. In the first nine years, I was heavily involved in the marketing and sales of products in Asia, especially Chinese and Asian language-related computing products. The best-kept secret was that I could not use Chinese on a computer myself even though I am one of the dying dinosaurs in my generation who can still recite and appreciate ancient Chinese poems. I simply do not know how to input Chinese characters using a keyboard.

Depending on the character sets, either from mainland China or from Taiwan, the number of Chinese characters can be from 6,700 to more than 13,000. Imagine using a 26-alphabet keyboard to input Chinese characters. By the way, a Japanese character set also contains more than 6,000 ideographic characters.

About seven years ago, I accidentally ran into a research scientist of Apple's famed Advanced Technology Group. He showed me a demo of Chinese dictation in a workstation. He

spoke into the computer and the Chinese characters appeared on the monitor. I fell completely head over heels for what I witnessed. What I saw was only the tip of the iceberg of speech and language related technologies. That demonstration changed my life. That was how I ran into speech and language technologies, which fascinated me and intertwined with my life for years to come.

I started out as an innocent user who was naively looking for a solution to his own inability to input Chinese ideographic characters using a traditional QWERTY keyboard. When I was first shown the speech technology, it did not dawn on me that I was looking at the future of the new user interface. Even when we first introduced the Chinese dictation product on Macintosh as early as 1995, I still could not fathom the significance of the event and could not sense the implications of this technology beyond its use as an easier input for ideographic characters. It was only after we began to talk to our customers after the product was introduced that we began to sense the excitement and its implications.

Nobody will disagree that we are in a knowledge-based information age. How we can harness the power of information through communication with people or any computing

devices will decide the winners. The dream is to enable individuals to communicate effectively and effortlessly with other individuals, regardless of language, where they are and what computing devices they own. That is the world of boundary-less communication.

Take programming a VCR. My parents do not know how to do it, and I do not either. Will it be simpler if we can simply talk to the VCR to record the program on Channel 7 from 7 p.m. to 8 p.m. next Monday?

Let me give another example. My father is 75 years old and does not speak anything other than Cantonese. A majority of my friends and colleagues do not speak Cantonese. In many ways, my father cannot share a very large part of my life because he cannot effectively communicate in other languages. Just imagine how happy he would be if he could pick up a phone in Hong Kong and talk to my son's teacher in Singapore. While he can continue to speak in Cantonese, my son's teacher can listen in English or Mandarin and respond in her language of choice. In return, my father would hear the response in Cantonese about how well or badly his grandson is doing and other interesting anecdotes which he can laugh at and cherish for days, weeks and even years to come. That

is boundary-less communication that brings people closer together without the constraint of languages.

My mother can serve as another example. She is a self-taught expert in knitting. She teaches other retirees in the neighborhood community center every year. She enjoys chatting with people about her technique, her patterns and her insight and enjoys sharing and learning from others. If she can easily use any computing devices to search on and learn from Web sites around the world and communicate with the knitting lovers effortlessly in Cantonese, the world will be a lot smaller for her and all of us will benefit.

So, what do people want? No matter what kind of computing devices people have, they largely want to use them to communicate, create, work, learn and play.

Communication between people or between people and computing devices boils down to two major media: They are simply some forms of text and speech.

The speech and language technologies will have the ability to provide an effortless, intuitive and easy-to-



Louis Woo, 51, is president and general manager of the Asia-Pacific region at Lernout & Hauspie, which makes speech and language technologies, products and services. Now based in Singapore, Woo is a veteran of Silicon Valley. He previously worked at Apple Computer and is a graduate of Stanford University.

use interface for people to do those functions regardless of languages.

My parents want to use any tools that will help them communicate better. But those tools have to be easy to use. It should be as easy as picking up a phone to talk.

As of today, we have technologies that can enable people to communicate in different languages. A person can effectively dictate into a computer in German that turns into text (German voice recognition). The text can immediately be translated into English (machine translation from German to English) and be sent through the Internet to a personal computer of an American colleague. The text will be read out by the personal computer (text-to-speech in American English). Upon hearing

from his German colleague, the American, in return, dictates his response in English, which turns into text (American English voice recognition). The text can then be translated into German (machine translation from English to German) and be sent back to the German through the Internet. The text will then be read out in German (text-to-speech in German). The cycle goes on.

Of course it is not as easy as picking up a phone yet. But most of the technologies are in place. It is just a matter of a few years before my mother can talk to my godmother in Malibu without worrying that they cannot speak each other's languages.

I believe speech and language technologies will be the cornerstone to bring people closer together, make the world a better place and to provide a higher quality of life for the rest of us.

- ▶ Computers can recognize what is said and talk back.
- ▶ Dragon Systems and IBM have programs priced under \$200 for "continuous dictation," which will listen to and reproduce words spoken by someone talking at a steady rate in phrases or sentences.