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# An Introduction to Chinese Computing in Singapore

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## Introduction

Compared with English computing, Chinese computing presents a very different, if not tougher challenge to IT researchers, programmers and users. From the day the computer was invented, it has been built for an alphabetic language, English and it is not suited to Chinese, a pictographic language. For the past twenty years, the greatest challenge among the Chinese computing researchers has been to develop software that can be used with Chinese language.

The recent rapid advancement of information technology has contributed tremendously to the development of Chinese computing. As Chinese characters are fundamentally different from the English alphabets, they require special treatment before the computer can process any information. A Chinese character needs double-byte instead of a single one. Thus it needs more memory space and faster processing to be comparable to processes using English letters. With the advancement in technology, this problem has diminished to a large extent. On the other hand, as the software technology has also improved immensely, the code structure and interface of many Chinese software are now more compatible with the latest operating systems and other commonly used English software.

The following sections will discuss the various types of Chinese computing systems, Chinese word processors and input methods.

## Chinese Computing Systems

It is a well-known fact that the computer world can be basically divided into the PC world and the Mac World. When it comes to Chinese computing, we are more concerned with whether it is a English Windows environment or a Chinese Windows environment. A document produced from one environment may not be understood by the other. A Chinese word processor running perfectly in one environment may not run in the other environment at all.

The English Windows environment is the one that is most commonly used in Singapore. We witnessed its evolution from Windows 3.0 to 3.1, and from 3.1 to Windows 95 and very soon we will see the arrival of Windows 98. Many Chinese word processors are able to work in this environment.

Chinese Windows, like Japanese Windows and Windows of other languages, has the same Microsoft windows interface but with different programming and language code. There are two different types of Chinese Windows, the *Fanti* (the original

complex Chinese characters) Big-5 code Chinese Windows from Taiwan and the *Jianti* (simplified characters) GB code Chinese Windows from mainland China. Big-5 is the code name for the united code of the five largest computer companies in Taiwan, whereas GB is the acronym for *GuoBiao*, meaning "national standard". Any document produced from one code has to go through a conversion process before it can be read and edited in the other code. Fortunately, the conversion is now much easier and more accurate compared to the past. This is especially important and useful when we surf the Internet, as we often need to convert the Chinese viewers from one code to the other to be able to view web pages written in either code,

## Chinese Word Processors

Chinese word processors can be divided into two categories according to the different working environments they are built to work in, one the English environment as the other the Chinese environment.

Unlike English word processors, most Chinese word processors working in the English Windows environment are built to run concurrently with English word processor. The most popular Chinese word processing software found in Singapore are *Chinese Star*, *RichWin*, *Hansvision*, *Twin Bridge* and *Nanjixing* (Northern Star). Most of them have no problem running concurrently with any popular English word processors like Microsoft Word, WordPro, WordPerfect, Write, Notepad, etc. To read or process a Chinese document, the user would first need to activate both the English and Chinese word processors in a English Windows environment. After that, the user can then switch to and from English and Chinese with great ease.

Chinese word processors built to work in the Chinese Windows environment work the same way as any English word processor in the English Windows environment. The most commonly used is Microsoft Word for Chinese. The latest version is Word 97.

## Chinese Input Methods

There are four commonly used methods to input Chinese characters: Keyboard, Handwriting recognition, Voice recognition and Scanning by OCR (Optical Character Recognition).

At present, using a keyboard to input Chinese characters is the most common practice. There are many options available, such as pinyin (Chinese Phonetic System), *Cangjie* (stroke oriented input system named after a legendary figure believed to be the

inventor of Chinese characters), *Wubi* (Five Strokes), *Zhengma* (Zheng Code), etc.

The easiest and hence most widely used in Singapore is *pinyin*. To input a Chinese character, the user needs only to know its correct pronunciation, the *hanyu pinyin* and the appearance of that particular Chinese character. For example, if we need to input a Chinese character "sky", we need to key in its *hanyu pinyin*, "tian". As there are many Chinese characters with the same pronunciation, we need to pick the right character from the list. Of course, there are more advanced methods of using *pinyin* to input Chinese characters, some of which can be very efficient, using a minimal number of key-strokes. For example, one would need to hit the keyboard 10 times to input the English word "university". To input its Chinese equivalent, "da xue", only 3 hits are needed: the initials "d" and "x", and the number "2" (this number is the position of the character in the list).

The other useful input method is *Cangjie*. According to Dr Der-Thang Chen (Division of Instructional Technology, School of Education, NIE), who is an expert in this input system, it is very difficult to learn the input rules. This is because the input rules are usually arbitrary and artificial. However, if one has mastered the rules, he should be able to type as many as 50 characters per minute while professional typists can easily type in excess of 150 characters per minute.

Handwriting recognition system provides another alternative to input Chinese characters. There are now a few software available in Singapore, such as *Mengtian* (named after a general from Qin dynasty believed to be the inventor of writing tools in ancient China), *ShuangQiao* (Twin Bridge) and *BoshiBi* (PhD's Pen). All these software come with peripherals including an electronic pen and a writing tablet. To input Chinese characters, the user writes on the tablet. Some Chinese educators prefer this method as they believe that it is the most natural and proper way to input Chinese characters. However, there is still room for improvement in the speed and accuracy of handwriting recognition systems as they are much slower than the keyboard input methods.

For voice recognition input systems, there is a Chinese Voice Recognition Kit available for Apple computers. This system is developed in Singapore by a team of researchers at the Apple company. According to users, the accuracy of speech recognition exceeds 90%. The voice recognition input for PC system is still in the developing stage. We have tested a few but none has been found satisfactory. We are still waiting to test drive the PC version of Chinese Voice Recognition Kit which was launched recently.

The fourth input method is by Chinese OCR scanning. It works just like the English OCR. After the successful installation of the Chinese OCR software and connecting the computer to a scanner, the Chinese characters of the source document can be scanned into the computer. A new editable document will be produced just as any other input method mentioned above. A few Chinese OCR software from Taiwan, mainland China and the United States are available. Creative Lab (Singapore) has also developed a set of Chinese OCR software. These software are still in the process of being tested.

## Conclusion

Chinese computing has flourished after decades of research and development. As educators and computing researchers, our further research will focus on answering the following three questions:

1. How can the advancement in Chinese computing help to improve the teaching and learning of Chinese?
2. How do we facilitate the accessibility of Chinese information in the Internet?
3. How can we motivate creative thinking through Chinese computing?

To many of us, the future of Chinese computing is as exciting as the rest of the computing world.

