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Nobody expected Java would become such an indispensable part of the IT landscape when it was first conceived 10 years ago. CHAN CHI-LOONG was in San Francisco to take a tour through the past, present and future of this landmark language

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"There is nothing more powerful than an idea whose time has come."
— Victor Hugo

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This opening line at the 10th JavaOne convention held in San Francisco two weeks ago described how Sun Microsystems' feel about Java, a language that has moulded the landscape of IT since it was born a decade ago.

Many would remember Java's slow tentative growth in its early years, but lately it has been found everywhere in the IT landscape.

As Sun chief executive officer (CEO) Scott McNealy accurately said, the company had under-hyped Java's development.

Today, Java is embedded in 2.5 billion devices around the world: 708 million on mobile handsets, another 650 million on Java desktops, and the remaining 1 billion on Java smartcards.

It is used by governments and big businesses in sectors like education, medical services, finance and entertainment. It can be found in all Fortune 500 companies. NTT DoCoMo, Japan's major mobile service provider, made US\$6 billion (S\$10 billion) from Java downloads, including games, ringtones and wallpapers last year. That's more than the total dollar value of all final goods and services produced for consumption in some countries.

Java for all seasons

There are many reasons why Java is so popular and has blazed a trail in the IT landscape.

Although it didn't invent virtual machines, bytecode, or the Write Once, Read Anywhere programming paradigm, it is the one language that has popularised all of these.

"When we first started, we could have gone either .Net or Java," said Mr Kevin Yang, chief technology officer of Hello Technology, a small five-year old software company based in Singapore.

"I'm glad we went with Java, because it allowed us to run our software on almost every platform."

This cardinal crux of Java is joined by an equally compelling reason for businesses: the software development kits for Java are free, and have been free since the beginning. For cash-strapped small businesses, this is a persuasive reason to get aboard Java.

Even way back in 1998, educational institutions were sitting up and taking note of Java.

Said Dr Khoo Siau Cheng, a computer science lecturer at the School of Computing at the National University of Singapore: "We switched to Java as one of the first few languages that are taught to students because there was already a market demand for it even in 1998."

Java was in demand because many

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YEARS OF JAVA

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deployments of IT solutions are written in a structured, top-down approach that the object-oriented programming (OOP) language was good at modelling.

The school also chose Java as an introductory language because it was clean, reasonably easy to learn, and forced students to become more disciplined coders. As a contrast, the other major programming language in contention, C/C++, is a lot more powerful in speed and machine-level code, but the programming syntax structure does not rigorously enforce that discipline.

As a computer science graduate and programmer, I can fully appreciate Dr Khoo's comments. Java remains one of my favourite languages — among languages like Scheme, C, Visual Basic and Delphi (Turbo Pascal) — because it has clean structures, good documentation, and a boatload of free tools available from the Java community.

One reason why Java has such a strong community behind it is because of the Java Community Process (JCP) that Sun pioneered. Revisions to the Java language are worked out by referendum, and companies and lobby groups have a say in influencing the roadmap of Java.

However, there are those who are unhappy with this model, as revisions are slow and some say Sun has too much control over the JCP process. Case-in-point: the cold war between IBM and Java the last two years over this, and IBM's launching of open source Eclipse as an alternative Java platform.

Still, no one can deny Sun has been good at promoting Java. In Singapore, Sun initiated the Java Tarik programme to drive R&D development in Java here jointly with the Infocomm Development Authority (IDA) of Singapore in 1997. Since then the programme has generated about \$140 million in investments from companies using Java to develop applications.

Other activities here include the Wireless Java Jam, a yearly event aimed at



Events such as Wireless Java Jam in Singapore encourage enterprising students to develop mobile Java applications.

enticing young enterprising students to develop mobile Java applications.

Perhaps the best evangelist is none other than the father of Java himself, Mr James Gosling. Inventor of acclaimed text editor Emacs, Mr Gosling is the quintessential uber-geek and looks the part: bald plate with full graying beard, rotund teddy-bear appearance, and an aw-shucks T-shirt and jeans attitude.

None of that belies the fact that he created the language 4.5 million programmers depend on for their livelihood. He joins an august list of programming geeks of the likes of Linus Torvald (Linux), Tim Berners-Lee (World Wide Web), and Richard Stallman (open source paradigm).

The future

For all the spats that IBM has with Sun, they seem to have patched up recently. Nothing is more telling than the fact that IBM inked another 10-year contract with Sun last month for Java technology in all of IBM's middleware offerings.

The result: No more fears of a split in Java that would be sure to create waves in the Java developer community.

The opening of Sun's Java implementation to the open source community announced recently at the JavaOne conference would turn the Java movement into a landslide as new programmers come aboard the platform, enticed by free and open software to develop applications.

Furthermore, many interesting new projects lie in the Java pipeline. Unveiled at JavaOne was the inclusion of Java into DVD players (called Blu-ray technology), making its footprint into homes all over the world.

Add to this are the millions of mobile enabled Java handsets, smartcards and new specifications like Java RFID (radio frequency infrared detection) that will really make Java ubiquitous.

For Sun, Java has made all the difference.

It seized the opportunity to be involved in many projects using Java and at the same time, grow into a sizeable computer firm.

E-mail: chi-loong@paperdden.com

Milestones of Java

- **1995:** Java is born. Initially released on the website wicked.neato.org. Netscape agrees to include Java in its browser.
- **1996:** Java Development Kit (JDK) 1.0 is released. Ten major OS vendors announce plans to embed Java into their products.
- **1997:** Java Web Server 1.0 ships. JDK 1.1 released.
- **1998:** Java Community Process (JCP) finalised. More than two million downloads of JDK 1.1.
- **1999:** XML support for Java announced. Java Server Pages (JSP) technology hits the world.
- **2000:** Java Technology on more than 1.5 billion devices worldwide. J2SE v1.3 released.
- **2001:** J2EE Patterns released
- **2002:** More than two million downloads of J2EE SDK.
- **2003:** Java.net is launched. Java is in 100 per cent of Fortune 500 companies.
- **2004:** Java-powered Rover lands on Mars. Tiger, Java 5.0 released.
- **2005:** Sun open-sources Java.