# Can China Top the U.S. in R&D?

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January 9, 2006

eWEEK.com Special Report:
Politics Meets IT

Technology vendors are not just selling products into the Chinese market these days. They are moving in.

Hewlett-Packard Co. opened a research lab, HP Labs China, in November, joining Microsoft Corp. and IBM and other IT companies that have set up research labs in the country to tap the increasing number of technical graduates Chinese universities are turning out.

The result: cutting-edge technology that will challenge U.S.-based research counterparts for next-generation development leadership.

A visit to Microsoft's Chinese research arm, known as MSR (Microsoft Research) Asia, in Beijing's Haidian district, provides yet another indication of the software maker's commitment to Asia.

MSR Asia employs about 200 researchers and has transferred more than 100 technologies from research to product teams for products such as Office XP, Office System 2003, Windows XP, Windows Server 2003, XP Media Center Edition, Windows XP Tablet PC Edition, Xbox, MSN and Vista. Wei-Ying Ma is a lead researcher at MSR Asia whose 18-person team is working on search and data mining technology. The sponsors of a recent technical conference said the group should really be called "Microsoft Research Army" because of the potent presence of Ma's group, which published 12 of the 71 technical papers delivered at the conference.

Not far from MSR Asia, across the Haidian district of Beijing, and in the Zhongguancun zone—known as China's Silicon Valley—sits IBM's China Research Laboratory. Both IBM's China Research Lab and the company's Beijing Linux Technology Center reside in the Zhongguancun Software Park, an ultramodern area whose architecture looks like a Jetsons-meet-James-Bond scenario.

**Click here for a slideshow featuring the Zhongguancun Software Park.**

Directly across from the park, China's Lenovo Group Ltd. has a massive R&D facility, while inside the software park, IBM has neighbors such as Oracle Corp., Iona Technologies, Siemens AG, Harbour Networks and Censoft.

**Though Linux is rising in popularity in China, the majority of enterprises still prefer commercial software over open-source middleware. Click here to read more.**

The common theme among the research companies eWEEK visited here was a focus on the enterprise.

Yue Pan, manager of semantic technologies research at IBM's China Research Lab, said his group is working on relationship analytics and an integrated ontology development tool kit. The tool kit is based on the Eclipse Modeling Framework, Pan said. Meanwhile, Chen Ying, senior manager of dependable and performance computing research at IBM's China Research Lab, said his group is working to improve the robustness of WebSphere and to deliver a model-driven approach to automating the management of all software running in a data center.

Excellence in search technology is Microsoft's main pursuit. "[Search] is so important from a business point of view," said Harry Shum, managing director of MSR Asia. "Whoever controls search today drives a lot of Web traffic. So it's really very dynamic. Three years ago, no one, even Google, had figured out this business model. And now, all of a sudden, everybody is rushing into this space. And Microsoft realizes we cannot lose the battle. We have to fight back, at least to get one-third of the pie."

The battle over search prompted the recent legal wrangling between Microsoft and Google over Google's hire of Kai-Fu Lee, a former Microsoft employee and the person Microsoft tasked with founding MSR Asia seven years ago. **Microsoft and Google settled the case** last month.

Kurt Akeley, assistant managing director at MSR Asia, said two of the lab's strengths are graphics research and search technology research.

"Typically when people do search today, it's one or two words, about 95 percent of the time," Shum said. "But if you have something reasonably complicated or reasonably long, we're still not there yet. So there is something called search relevance that Google has been ahead of most competitors in. But the gap is closing. And Yahoo [Inc.] claims statistically that this difference does not even exist anymore between Google and Yahoo. MSN, with a lot of help from MSR, is closing the gap."

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The goal of the Web Search & Mining Group at MSR Asia is to drive the next generation of Web search by leveraging data mining, machine learning and knowledge discovery techniques. MSR Asia is working on mobile search, multimedia search, vertical search, and unstructured or structured Web data. Ma said the most important area his group of researchers is working on is called object-level Web search.

"If the [search] engine can further analyze all the data associated with this particular object and provide some statistics or even mining results and show you some intelligence about this object, I think we can move the search performance to one level up," Ma said. Ma demonstrated a prototype academic search engine MSR Asia calls "Libra" that uses the object-level search capability. "Libra is not a product yet, but we are currently working with the MSN search team in building this academic search engine," he said. Ma said he hopes to release early services by midyear.

Microsoft's Beijing research lab differs from some of the company's other research labs in terms of the diversity of the researchers, not in nationality but in skill.

"Compared to other labs, my team is more diverse," Ma said. "I have people from data mining, databases, machine learning, information retrieval, distributed computing, multimedia ... mobile search. So I would categorize my team here as multidisciplinary."

Some of the technology that will make up Microsoft's Live software-as-a-service strategy will come from MSR Asia, Shum said. "Another good example that's even closer to announcement is Microsoft's Ad Center," he said. "So the advertisements, the platform, a lot of that technology is from this lab here."

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Jian Wang, research manager of the Multimodal User Interface Group at MSR Asia, demonstrated a prototype of a new pen computing mechanism Microsoft has developed, known as UPen, or Ubiquitous Pen.

"We're working on the user interface; particularly we're working on pen computing," Wang said. "We're just looking for new ways that a human can interact with a computer system."

Wang said his group is working in two different directions. "One is how to develop technology to make existing computer systems—like laptop and Tablet PC—much more pen-friendly," he said. "Secondly, we are working to make pen computing more pervasive."

The UPen makes every printed document digital, Wang said. The pen features a very small camera at its writing tip for tracking what is written or capturing hand-written mark-ups on printed documents. The UPen features handwriting recognition software, "a processor, memory, storage, and it has [Windows] CE 5.0 running on it," Wang said.