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China's IP protection minefield: separating fact from fiction

China is the key emerging market for international technology companies. Smart, well-informed IP and business strategies are required if companies are to make the most of what the country has to offer

By David Llewelyn and Peter J Williamson

The boards of many foreign companies are counting on a share of China's market to support their top-line growth in coming years. However, they should be aware that engaging in the Chinese market will expose their high-value technologies, trade secrets and know-how to the risks and vagaries of the Chinese IP environment.

There are several reasons for this. First, Chinese companies have begun to establish R&D centres overseas and to acquire high-tech companies which give them access to both existing technology and ongoing R&D and design capabilities. Chinese acquisitions abroad exceeded \$105 billion in 2013. Of these, industrial acquisitions – which focus on acquiring technology and R&D capacity – accounted for 20%. These acquisitions are helping Chinese companies to close the technology gap with multinationals, meaning that foreign companies will increasingly need to deploy state-of-the-art intellectual property to compete successfully in China.

Second, the Chinese government has embarked on a clear policy of strengthening innovation capabilities within China. Given its huge foreign exchange reserves and lack of need for foreign capital, this means that the Chinese government is unwilling to approve foreign investments that do not bring leading-edge technology and intellectual property into China.

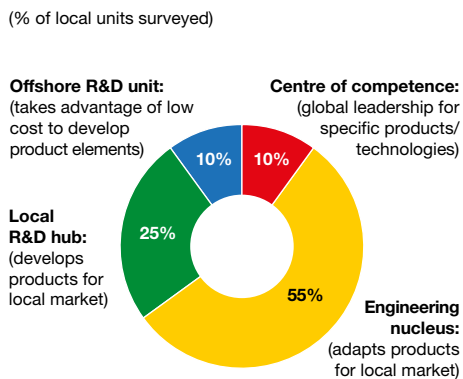
Third, more foreign companies are expanding their R&D, innovation and design activities in China to take advantage of lower costs, the local availability of engineers and scientists, and distinctive local know-how – especially when it comes to creating products and services that are suitable for China and other emerging markets. Recent statistics identify at least 1,200 foreign R&D centres located in China, with investment in these facilities totalling \$12.8 billion. Many are now responsible for developing new products and technologies, rather than making a limited contribution to global projects (Figure 1).

These developments mean that foreign companies need to find effective ways to manage an ever-greater quantity of higher-value intellectual property in China.

IP risks in China

EF Kluff & Co agreed to let a Chinese partner market its line of luxury mattresses, which sell for between \$3,500 and \$70,000 and which are designed and manufactured by Kluff in California. Strong initial sales quickly declined as retailers started displaying suspiciously similar designs from competing brands. Lacking any design protection in China, Kluff's only option was to terminate the agreement. However, pictures of its designs remained on display. Some have argued that the prevalence of copying in China reflects deep-seated cultural attitudes which do not merely value originality, but view the art of reproduction as equally demanding and, when carried out exquisitely, perhaps even superior – Qin Shihuangdi, the first ruler to unify the core kingdoms of China, was famous for building a replica of every former ruler's palace outside his own capital of Xianyang after each conquest.

Figure 1. The role of foreign R&D units in China



Data source: The Boston Consulting Group 2013

Other risks of IP leakage in China are more complex and nuanced. In 2004 the Ministry of Railways embarked on a long-term development plan to invest \$29.3 billion building 18,000 kilometres (km) of dedicated high-speed rail lines by 2015. By the end of 2013, some 10,500km of high-speed rail was already operational, but the source of the technology remains a matter of controversy. German news magazine *Der Spiegel* has argued that: “using both the political bait of forming joint ventures and deft negotiating tactics, China attracted leading Western engineering companies to China – such as Siemens from Germany, Alstom from France, Bombardier from Canada and Kawasaki from Japan. Once it had these foreign companies where it wanted them, it played them off against each other so that they would relinquish key pieces of technological know-how at a low price.”

Kawasaki Heavy Industries (KHI) cooperated with its Chinese partner, China South Car (CSR), to produce high-speed trains. However, within two years of commencing operations, CSR began producing similar models independently with no assistance from KHI. According to CSR President Zhang Chenghong, CSR “made the bold move of forming a systemic development platform for high-speed locomotives and further upgrading its design and manufacturing technology. Later, we began to independently develop high-speed trains with a maximum velocity of 300-350 kms per hour, which eventually rolled off the production line in December 2007.” Since then, CSR has ended its Chinese cooperation with KHI.

The Chinese company points out that it has adapted and developed the transferred technology and filed more than 940 applications for patents of its own. It also argues that foreign train makers are fully aware that technology transfer is an important aspect of gaining access to the China market, and that the Ministry of Railways has now ordered over 400 new-generation trains from joint ventures involving Siemens and Bombardier.

At risk from these practices are not only patented technology and design blueprints, but also trade secrets or confidential information (eg, how to make a product) which are often valuable to competitors. Trade secrets are especially exposed because many literally walk out the door in the heads of employees, no matter what an employment contract may say.

This is a particular problem in China, where employee turnover across sectors

tends to be high (Figure 2). In June 2013, for example, China’s largest wind turbine producer Sinovel and two of its executives were charged in a US federal court with stealing trade secrets from its former software supplier, Massachusetts-based American Superconductor (AMSC). The suit was initiated after a former employee of AMSC pleaded guilty in Austria to stealing source code for turbine controllers. Sinovel’s deputy director of R&D Su Liying, its technology manager Zhao Haichun and former AMSC employee Dejan Karabasevic were each charged with conspiracy to commit trade secret theft, theft of trade secrets and wire fraud. AMSC claims that Sinovel used its software in four Sinovel turbines installed in the United States less than 40 miles from AMSC’s global headquarters, which its president described as showing “not only a blatant disrespect for intellectual property but a disregard for international trade law”.

Given that the IP exposures associated with operating in, or even supplying to, the China market are significant, two questions arise. First, what legal protection is available from the Chinese IP regime in practice? Second, what other pragmatic strategies might companies adopt to reduce the likelihood or negative impacts of IP leakage associated with doing business in China?

Strengths and weaknesses of China’s IP regime

Although China joined the World Intellectual Property Organisation (WIPO) in 1980, it was only after 1992 that broad-ranging IP laws, regulations and administrative procedures were established. These were subsequently refined so that today China has a comprehensive IP protection regime. Intellectual property can also be protected by recourse to China’s unfair competition and trade secret laws and regulations.

This IP protection system is now actively used. According to the latest published statistics, the State Intellectual Property Office (SIPO) received 825,000 invention patent applications in 2013, a 26.3% increase on the previous year. Some 85% of these were from domestic applicants (including applicants from Taiwan, Hong Kong and Macao). SIPO had a total of 2,954 patent examiners in 2011 (compared with 6,300 at the US Patent and Trademark Office (USPTO) for that year), with plans to increase the number to 9,000 by 2015. SIPO granted 205,000

invention patents in 2013 (down by 4.1% on the previous year due to more stringent vetting) – with 55% going to domestic applicants and 45% to foreign applicants.

However, relying solely on legal protection is not viable for most companies in China. This is not because of any deficiencies in the legislative framework – although there are some peculiarities with Chinese IP laws compared with practice elsewhere. For example, China's Trademark Law follows the first-to-file rule, which stipulates that a trademark is granted to the party that files first, rather than the party that first uses the trademark, as in the United States. This disparity can result in trademark squatting, when local Chinese businesses and individuals are granted trademarks for foreign products – a problem complicated by numerous alternative Chinese translations or transliterations of foreign trademarks.

However, in general, Chinese IP legislation is closely aligned with international standards – in part because revisions have been shaped by the conclusion of international treaties. Sometimes China is even ahead in legislative terms – for example, it adopted the first-to-file rule for patents (as used in Europe and elsewhere) in its original legislation. This was not incorporated into US law until the passage of the Leahy-Smith America Invents Act in 2011.

Instead, the two main factors limiting reliance on the legal and regulatory regime for IP protection in China are the practicalities of enforcement in many parts of a huge country and the fact that much critical intellectual property belonging to foreign companies takes the form of trade secrets.

Enforcement

Specialised IP courts have been established in major cities and provinces to handle IP infringement cases. In 2013 the Chinese courts handled a total of 100,399 first-instance IP cases. Nonetheless, there has been much criticism of the reliability of the processes and judgments of the IP courts. China uses a civil (not common) law system, where little to no deference is given to prior decisions of judges facing the same issues. In theory, each judge reading the same statute is expected to arrive at the same interpretation. Of course, as in any legal system, this is often not the case in practice. Instead, the lack of precedent results in divergent interpretations from different courts. This can be exacerbated by a shortage of

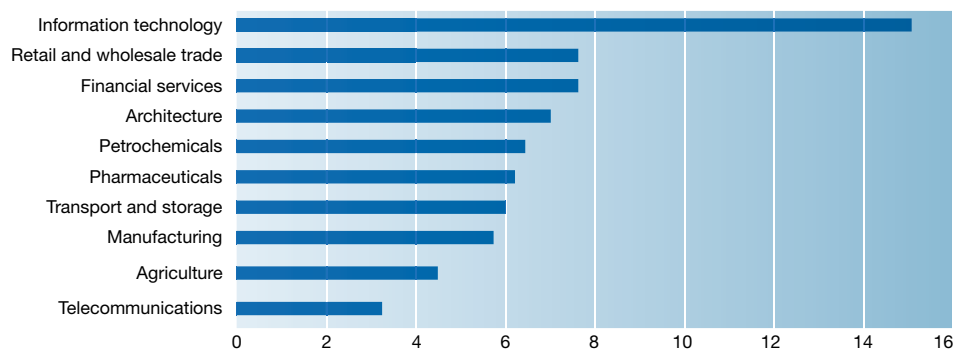
qualified specialist judges and experienced IP lawyers and advocates in China, particularly in less developed provinces – which have also been accused of local protectionism.

Despite these problems, the aggregate data suggests that foreign litigants do in fact have a good record of success in IP litigation in China, winning between 90% and 95% of reported cases on average across all Chinese courts. Another study of patent cases in 2010 found that the probability of a foreign litigant winning was 60% when the opposing party was a Chinese entity. Chinese IP trials also tend to be quicker and cheaper than those in common law countries. Chinese patent cases, for example, often take just six months from filing the complaint to trial and another three months for appeal, compared to a norm of several years in the United States. One reason for this is that there are no juries (as is the case in the United States); nor is there the potentially lengthy pre-trial process ('discovery' in the United States and 'disclosure' in the United Kingdom). Chinese trials are much closer to those in continental European countries with roots in Roman law where a presiding judge runs cases tightly.

Chinese administrative processes can also be used to avoid taking a dispute to court by directly requesting the local authorities in charge of enforcing intellectual property for redress against infringement. This enforcement route is generally cheap, quick and simple (the maximum time for submissions and action is set at four months). Local authorities can impose an injunction and mediate (but not compel) the payment of damages. If mediation fails, the patentee can then

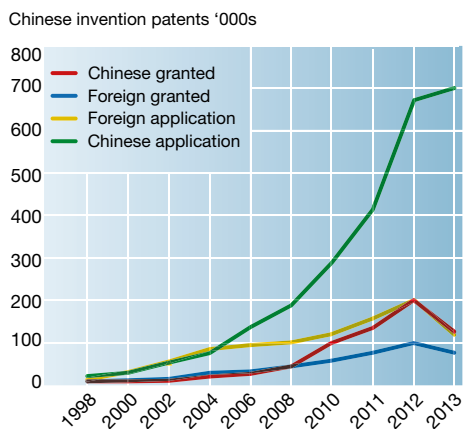
Figure 2. Trade secrets exposure – high employee turnover in China

Employee turnover by industry sector (%per year)



Data source: Ernst and Young, 2011

Figure 3. **Growing domestic and foreign patent activity in China**



Note: Excludes 1.5 million utility model and design patent applications

sue the infringer in court. Initially, many companies found that local authorities were reluctant to pursue enforcement, but in the last few years the enforcement capacity of local IP offices has improved significantly.

Therefore, foreign companies should not assume that IP rights are unobtainable or unenforceable in China, or that Chinese courts will always favour Chinese parties over foreign parties. However, in common with much of the rest of the world, the system is imperfect and sometimes unpredictable. These limitations are exacerbated when a company's valuable intellectual property takes the form of trade secrets.

Protecting trade secrets in China

China instituted a legal framework for the protection of trade secrets under the Anti-unfair Competition Law in 1993, which was further clarified in January 2007. In lay terms, Chinese law states that a trade secret cannot be something known by the general public or by competitors. It must give you a competitive advantage or be capable of generating economic benefit, and you must have taken reasonable measures to protect the confidentiality of the information.

General Electric (GE) was one of the first foreign firms to successfully bring an action under the new provisions, in a 2007 case involving its medical systems business. GE discovered that an ex-employee was offering training courses using GE's trade secrets. It filed a complaint with the Hangzhou Administration for Industry and Commerce, which duly inspected the training company's premises, resulting in the seizure of a large quantity of GE materials. Using this evidence, GE subsequently brought a case against the ex-employee in the People's Court of Xi'an for misappropriating trade secrets and copyright infringement. The court ruled in favour of GE and ordered an injunction and

damages of Rmb900,000 (\$140,000).

To use this legal route, the first step is to identify information that can justifiably be regarded as a trade secret. Documents or electronic formats containing this information need to be labelled as confidential or encrypted, and where possible securely stored and their transfer and sharing logged. Employee manuals and employment contracts must be drafted so as to be consistent with the burden of proof required by Chinese trade secret laws (eg, making it clear how confidential information should be handled and emphasising to employees that they have a duty of confidentiality).

It is also necessary to scan the market continually and visit suppliers to identify fake or copied products as soon as possible after they appear on the market. This includes attending trade shows, monitoring e-commerce sites such as Alibaba and making mock purchase calls.

However, even if it is possible to invoke the relevant legal protection, the damages awarded can be inadequate. In a case recently publicised by the UK Intellectual Property Office concerning integrated circuit (IC) cards, the people's court agreed that a foreign company's IC card technology was a trade secret and that, based on evidence found on computers, a former employee had used it to help establish a competitor making an almost identical product. Despite this, the court awarded damages of only Rmb136,450 (approximately \$22,000).

Given these limitations, it is often advisable to enforce IP protection outside China. Ford Motor Company became aware that Xiang Dong Yu, a former Ford product engineer from 1997 to 2007, intended to return to the United States in 2011. Ford had evidence that before he told Ford of his new job in early 2007, Yu had copied some 4,000 Ford documents onto an external hard drive, including sensitive designs that cost millions of dollars and decades of research to develop. On entering the United States, Yu was arrested, based on information provided by Ford, and was eventually sentenced to 70 months imprisonment in Michigan and fined \$12,500 for stealing trade secrets.

However, even a comprehensive set of procedures that makes use of both Chinese and foreign laws usually needs to be supplemented with other strategies.

Navigating the minefield

A pragmatic approach to navigating the IP minefield in China must start with

“ Foreign companies should not assume that IP rights are unobtainable or unenforceable in China, or that Chinese courts will always favour Chinese parties over foreign parties ”

recognition that technological upgrading – including the promotion of spill-overs from foreign investment – is a key pillar of China’s development policy (sometimes through requirements for technology transfer as a condition for participation in major projects).

Some companies believe that the solution is simply to avoid taking their intellectual property, including trade secrets, to China – even if this means forgoing opportunities for revenue and profits or limiting their involvement purely to the export of final products to China. However, intense competition from both Chinese and foreign rivals means that a pure export strategy is less and less viable. Moreover, even attempts to protect intellectual property by keeping it walled off back at home do not ensure that a product’s advantages cannot be matched in China. Modern communication systems easily enable local companies to view intellectual property that has been registered overseas. Many Chinese companies have large numbers of staff devoted to tracking new developments in relevant scientific and technological fields around the world. There is a large pool of scientists and engineers who are exceptionally skilled and experienced in developing parallel products which match the performance of the foreign counterparts without necessarily violating IP rights. Chinese companies have also become adept at taking a product or service concept and developing parallel innovations of their own which can deliver the benefits using different technologies and approaches. Alibaba, for example, has developed its own infrastructure and technologies to deliver the same concepts that underlie PayPal and eBay – often taking the functionality of these well beyond the original idea. So simply trying to lock up intellectual property, technology and know-how at home does not guarantee that the customer benefits will not be replicated in China by other means.

We believe that a more effective approach, which also opens the way to seizing opportunities in the Chinese market, is to adopt a strategy of ongoing engagement using a mix of approaches for both exploiting and protecting intellectual property in China. These are outlined below.

Compartmentalising intellectual property and R&D

The starting point of this strategy is to identify what aspects of intellectual property and associated knowledge need to be shared with Chinese distributors,

“Even attempts to protect intellectual property by keeping it walled off back at home do not ensure that a product’s advantages cannot be matched in China”

suppliers or partners in order for them to support and perhaps even adapt and improve your product or service effectively. Decisions can be taken about what needs to be shared and what can remain in a black box. A helpful rule of thumb is to share the interfaces but not the core and, as one IP lawyer experienced in China recommends, “transfer that part [of the IP] that is most easily reverse engineered or easily dissected”.

Separating hardware from software may also be an effective strategy. An increasing number of products, including industrial machinery, cannot function effectively unless the hardware and software work together in concert. Some companies therefore retain elements of the software on secure servers overseas to reduce the risk that imitators can achieve the same performance even if they copy the hardware. Continually updating this remotely hosted software further reduces the probability of damaging imitation.

When AMSC opened a factory in China to assemble power convertors for wind turbines, it took the precaution of separating out software and keeping the source code for its control system on a secure server at its R&D centre in Klagenfurt, Austria. It is perhaps testament to the effectiveness of this strategy that one of AMSC’s former Chinese customers, Sinovel, is alleged to have contracted to pay \$1.7 million in 2011 for access to the software to a rogue AMSC engineer working at the Klagenfurt centre, who stole it, as we have already described.

Even where it is necessary to share many product details (or where these can be understood by deconstructing the final product), it may be possible to keep secret the knowledge required for product development in order to stay ahead of imitators as new generations evolve.

Upfront agreements to share markets internationally

One strategy to mitigate the risk that the Chinese partner will eventually become a

new competitor in the global market using intellectual property resulting from the initial cooperation is to agree upfront an arrangement to divide up international markets for the resulting products. Typically, the Chinese partner will be given the rights to sell the products in China and potentially other emerging markets where its capabilities and experience in marketing and distribution are most relevant. The foreign partner, meanwhile, might retain the rights to sell the products in its home market and other developed markets where it has established distribution networks. For the foreign party, such agreements have the advantage – subject to antitrust considerations – that any violations can be pursued through courts outside China. For example, when HUYA Bioscience International (San Diego) entered into a co-development agreement with Shenzhen Chipscreen Biosciences for a prospective cancer treatment, Chidamide, it was agreed that Chipscreen would retain the marketing rights in China, with HUYA retaining the remaining global marketing rights.

In other cases the parties could agree that sales into the global market will be made by a joint venture rather than independently. This was the case when Chicago-based Velsicol Chemical LLC, a leading specialty chemical company, announced a joint venture with ECOD Specialties Co, Ltd of Wuhan, China in October 2013. The joint venture is located in Wuhan and will not only manufacture, but also sell its environmentally friendly plasticisers globally, with Velsicol acting as its sole marketing agent worldwide.

Staged timetables for technology transfer

Another strategy for managing IP risks is to agree a timetable to manage the speed of technology transfer to a Chinese partner. In 1999, for example, Airbus signed an agreement with China Aviation Industry Corporation (AVIC), under which Airbus would transfer manufacturing technologies and production lines used to manufacture A320 wing components, with the objective of enabling China to manufacture whole wings. This agreement specified a staggered transfer of technology over seven years. The first two phases included technology for the manufacture of the fixed leading and trailing edges of the wing, respectively. In the third phase, Airbus placed more engineers in its Chinese partner's factories to enable local manufacture of the wing box. By July 2007 the first China-made A319 wing box was delivered to Airbus.

This approach was replicated when Airbus began manufacturing its A320 family of aircraft in China in a joint venture with AVIC in 2008. Initially the aircraft was assembled in China from kits, with 95% of the parts imported as sub-modules, already painted and with the seats installed. From that starting point, "one by one we start to transfer parts, but each subassembly is a complex project – it takes five years", the general manager of Airbus's assembly operation in Tianjin was quoted as saying in 2013.

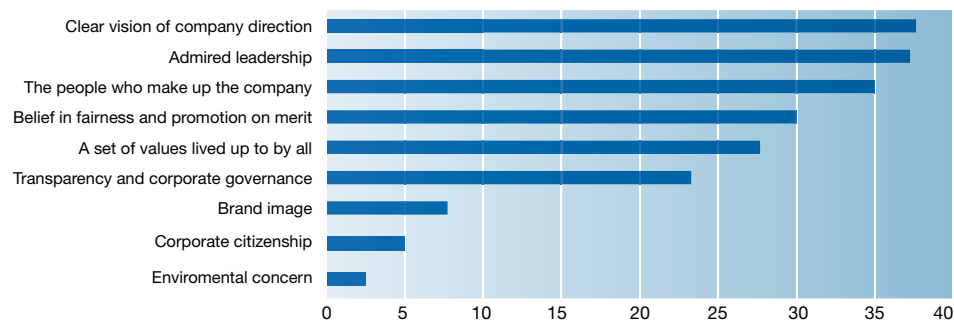
Reciprocal sharing obligations

In seeking to mitigate the risks of IP leakage, it also important to recognise that working with Chinese partners can result in the base technology being improved locally. Chinese parties often bring complementary skills and a deep understanding of local customer needs, which can stimulate derivative innovations. IP strategies should be designed to make sure that your company can capture a share of the rights to these improvements.

The China General Nuclear Power Company, for example, enhanced the French 900 megawatt electrical (MWe) three-cooling-loop reactor design transferred to China by French nuclear company Areva in the 1990s into a more powerful and more cost-efficient 1,000MWe CPR-1000 design. The new design was quickly deployed, with 15 units under construction by June 2010. Areva's partnership agreement enabled it to share the IP rights for the new design, which it is reported to be considering marketing outside China as a way of unlocking other emerging markets.

Figure 4. Company culture and employee morale in China

Most important Chinese aspects of company culture, Chinese-language speakers (% of respondents citing aspects as one of their top two)



Data source: MRIC Group 2014 (www.mric.asia)

Implementing complementary HR policies

Given the significance of trade secrets and their inextricable links to the motivations and actions of staff, HR policies must also be part of any overall IP strategy. High growth in China means that many employees aspire to rapid career advancement and keep a close eye on their progression relative to their peers. Unless policies provide opportunities for continuous learning and a clear career ladder, retention will be impaired and trade secrets will keep flowing out of the door. Programmes therefore need to be designed both for ongoing training and for comparing internal and external candidates for vacancies when they occur, taking the likely impact on intellectual property into account.

It is also often useful to address the risk of trade secret leakage from the other direction: trying to convince employees that proprietary knowledge is unlikely to be of value if taken out of the context of the company, its products and brand equity. This means emphasising in both internal and external communications that the company's value proposition is underpinned by the total package that customers receive, rather than by a specific technology or a particular product alone.

Aligning IP strategy with government policy

Aligning one's IP protection strategy with Chinese government policy almost inevitably involves adjustments and compromises. However, a strategy that is in tune with the flow of the river is much more likely to deliver long-term success than one that is continually fighting against it. This is well demonstrated by Microsoft's experience in the early 2000s.

In 1992 Microsoft formally began offering its software in China. Its strategy was to sell products at prices similar to those it charged elsewhere in the world. Windows and Office were adopted enthusiastically, but almost all of the installations were pirated. Microsoft's immediate response of taking counterfeiters to court attracted unwelcome publicity, to the point where even its former country manager described the company as "arrogant and selfish" and "an enemy of Chinese consumers". As a result, the Chinese government began actively promoting a Chinese version of Linux.

By 2001 Microsoft realised that its usual pricing and IP protection strategies

Action plan

A

When developing IP strategies for China, technology companies should focus on the following key points:

- Take a pragmatic, multi-pronged approach while recognising that technological upgrading is a key pillar of China's development policy.
- Utilise the legal protection available in China, but do not depend solely upon it.
- Actively pursue Chinese infringers outside China as soon as they venture abroad.
- Agree with Chinese partners upfront how to share markets internationally.
- Compartmentalise proprietary know-how, transferring only some of the pieces to China.
- Implement a staged timetable for technology transfer in discrete packages.
- Incorporate reciprocal obligations for Chinese partners to share their innovations or incremental improvements.
- Implement complementary human resource management policies to reduce the leakage of trade secrets.
- Try to align your strategy as far as possible with Chinese government policy.

were doomed to failure in China and changed tack. It upgraded the R&D centre it had first established in China back in 1998 and then set about repairing relations with the Chinese government, including agreeing in 2002 to give government officials controlled access to the source code for Windows and certain technical information needed to assuage concerns about software security.

Through a series of high-level meetings Microsoft also learned the importance that the government placed on developing China's software industry. From 2002 it agreed to invest \$750 million over three years in joint ventures and university laboratories, training programmes for teachers and software entrepreneurs, working with the Ministry of Education to finance 100 model computer classrooms in rural areas and making Shanghai a global centre for responding to customer emails. It also adapted its pricing strategy and began to offer extremely low-priced software bundles for segments such as students.

Microsoft's then newly appointed country head for China, Tim Chen, described the shift: "We started changing the perception that Microsoft is the company coming just to do anti-piracy and sue people. We changed the company's image. We're the company that has the long-term vision. If a foreign company's strategy matches with the government's development agenda, the government will support you, even if they don't like you."

The new strategy began to pay dividends. The Chinese government required central, provincial, and local authorities to begin using legitimate software (eg, by 2006 the city of Beijing

had completed the shift). It also required local PC manufacturers to load legitimate software on their computers (previously even the market leader, Lenovo, had been shipping 90% of its machines naked – with no operating system installed). By 2007 Microsoft estimated that the number of new machines shipped with legitimate software nationwide had risen from about 20% to more than 40%. While Microsoft's China revenues are reported to average no more than \$7 for every PC in use (compared with between \$100 and \$200 in developed countries), its experience suggests that aligning IP strategy with government policy is a valuable part of the toolkit in China.

The art of the possible

China has strong legislation to protect intellectual property and serious efforts should be made to ensure that your company is successfully utilising the legal protection available, both inside China and abroad. However, a combination of patchy,

sometimes inconsistent enforcement and the importance of trade secrets, which are difficult to protect by legal means the world over, means that rigorous IP management needs to be supplemented by the pragmatic strategies described above.

Ultimately, the best protection is to stay ahead of the competition as each new cycle of innovation unfolds. However, a well-crafted and pragmatic strategy to navigate China's IP minefield can help to make sure that you profit before the competition catches up with the last wave. **iam**

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