

Emerging Markets

Inside the Hermit Kingdom: IT and Outsourcing in North Korea

A unique perspective on an evolving technology sector.

THE OUTSIDE WORLD'S view of North Korea ranges from the fear of nuclear demagoguery, through tales of economic difficulties, to the fun poking of the film *Team America*. Behind these and many other—almost universally negative—projected images of the country, there is another side. Somewhat unexpectedly, the Democratic People's Republic of Korea—to use its official title—has a sizeable IT sector. Some 10,000 professionals work in the field, and many more have IT degrees. They are already engaged in outsourcing contracts for other countries, and keen to expand further.

North Korea's IT Sector

The origins of the local IT sector can be traced back to the 1980s, with the establishment of various IT research organizations and the creation of IT faculties in higher education institutions such as Kim Il Sung University and Kim Chaek University of Technology (the latter having an international collaborative research program with Syracuse University). Over time, several hundred IT “corporations” have

emerged, which fall into three main types, all state owned in whole or part.

There are a number of large specialist IT service providers who work both for local and overseas clients. The biggest of these is the Korea Computer Center (KCC). Established in 1990, it has more than 1,000 employees. Like almost all IT firms, it is headquartered in the capital, Pyongyang, but also has regional branches throughout the country and offices overseas that enable it to work for clients in Europe, China, South Korea, and Japan. Despite

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its export work, KCC's main focus has been the local market and it develops various products, such as Red Star (the North Korean version of Linux), e-learning products, and translation software. KCC also produces games; their version of Go, a popular Asian chess-like game, has won the Go computer games world championship for several years. Similar, but smaller corporations such as the Pyongyang Informatics Centre and Korea Pioneer Technology are employing hundreds of staff.

Some IT firms have developed from the internal IT departments of large commercial enterprises, such as Unha Corporation or Korea Roksan General Trading Company. As the country's IT sector has become more dynamic, some of these are being spun off as separate ventures, allowing the IT firms to take on a broader scope of clients and IT service activities. Third, there are a number of joint venture IT firms. These include Nosotek (set up with a German entrepreneur) and Hana Electronics (which involves U.K. investment), plus several joint ventures with Chinese business partners.



An IT company in Pyongyang, North Korea. Pyongyang has become a base for IT offshoring.

Historically, North Korea's IT infrastructure has been behind the curve but in recent years the country has been investing in order to catch up. In a typical IT firm, one can therefore see staff using state-of-the-art technology, mostly imported (for example, hardware from Dell, running the latest versions of Windows or Unix).

Internet access is still heavily regulated but a recently laid optical fiber backbone connecting all cities and counties provides for a high-speed network—"Kwangmyong"—utilizing a fairly sophisticated architecture that forms what can be seen as a "national intranet." A nationwide 3G mobile telecommunications network was completed in 2009. Mobile operator Koryolink (a joint venture with Orascom Telecom from Egypt) has more than one million subscribers.

Of course, the core of any IT sector is its human resources. As noted earlier, some 10,000 professionals already have IT careers, and thousands of North Korean youngsters graduate with IT degrees each year, thus creating a large pool of technically qualified staff. In the corporations I have visited, there are

always significant proportions of M.S.- and Ph.D.-qualified software engineers, and a surprising number have participated in training courses abroad: most often in China and India, but also in Europe. These organizations are already well versed in quality assurance methods including ISO9001 and CMMI.

An example of the typical skills profile is shown in the accompanying table, which gives the expertise list for Daeyong Corporation, a relatively small start-up based in Pyongyang that is involved in Web and mobile applications development—including Android and Blackberry—for foreign clients.

IT Outsourcing to North Korea

Having access to a pool of highly technically skilled labor is a key rationale behind the growth of IT outsourcing to North Korea. But such labor is available in many parts of Asia. A unique selling point for North Korea is cost. Tariffs asked can be less than U.S. \$10 per hour, enabling clients to employ experienced software engineers for just a few hundred dollars per month. This means North Korea undercuts not just India but also later-emerging software loca-

tions like China or the Philippines. The country's highly regulated economy is also an advantage in reducing attrition rates—the type of "job-hopping" that can bedevil Indian contracts is pretty much unknown in North Korea.

Some of the outsourcing to Pyongyang-based firms is quite general. At the fairly low-skill end is basic digitization. For example, Dakor—a Swiss joint venture—is conducting data entry work for European research firms and international organizations like the United Nations and the Red Cross. Work involving more skill includes producing Web sites for U.S. and European customers (though in most cases, the end client is unaware of North Korean involvement since this is subcontracted by an intermediary that deals direct with the client). Examples of projects involving more advanced skills include North Korean firms providing programming inputs for enterprise resource planning systems, business process management systems, and e-business applications. One corporation is building a bank management system—based on the tenets of Islamic banking—for a client located in the Middle East.



IT security, such as facial recognition, is an important export commodity for North Korea.



Developers working on a graphics design project.



North Korean firms produce and export high-quality cartoons and animation work.

But there are also emerging specialisms within North Korea's IT export sector. Perhaps not surprisingly, one of these is IT security. North Korea might have an image—warranted or not—of encouraging cyber attacks, but it has invested a lot in technology and expertise to thwart such attacks on its own systems and, more generally, in security. Fingerprint identification products used for access control (and time attendance) have already been exported, and there are other products developed in areas of car license plate identification, and voice/face recognition.

On the lighter side, film has been one of the main forms of state-supported entertainment in the country since the formal division of the Korean peninsula into two states in the 1950s. From this foundation has developed an export production capacity for high-quality cartoons and animation. The specialized state corporation SEK Studio, established in 1957, has more than 1,600 employees, and works for several European film production studios. Other firms have worked on 2D and 3D animation contracts, and this is starting to expand into areas of related capability such as computer graphics and games exports for Wii, iPhone, BlackBerry and other platforms.

Finally, North Korean IT corporations have developed a set of language skills. English is quite widely used but specialisms have developed in Chinese and Japanese alongside (of course) Korean. North Korea is therefore being used as a base for those who wish to have software products or systems translated into East Asian languages. At present, much of this work is near-shoring; that is, coming from clients based in China, Japan, or South Korea. But the potential is there for a wide range of customers who are targeting East Asian markets, which are considered especially relevant to small- and medium-sized clients.

The Challenges and Future of IT Outsourcing

North Korea's IT sector faces a number of challenges, despite its government's eagerness to promote international collaboration. First, and perhaps largest, is the challenge of perceptions. North Korea confronts a difficult mix

Example of a North Korean IT corporation skill set.

Major Skills	Ansi C/C++, VC++6, VB6 VC++.NET/CLR, C#, VB.NET, ASP.NET, .NET DotNetNuke, Silverlight, Telerik Sitefinity Java, J2EE, Spring, Struts, Hibernate, Swing, JUNIT, ANT JBoss, Apache Tomcat PHP4/5, Joomla, Wordpress, Magento, Drupal Zend Framework, CodeIgniter, CakePHP, Yii, Smarty MySQL, MSSQL, MS Access, PostgreSQL, Oracle Shell script, JavaScript, VBScript jQuery, extjs, dhtmlx suite HTML4.01, HTML5, XHTML, CSS2.0, CSS3.0 XML, XSLT, Web Services Flash, Flash AS3, Flex
Experienced Techniques	phpNuke, phpBB, Symfony Axis2, Velocity, POI, JSF Microsoft Speech API Google Android Phone, iPhone J2ME, Brew, Perl
Specialized IT Areas	Web Applications, E-Commerce, Blogs, CRM, Social Networking General Windows utilities, Windows/Linux Networking Reverse Engineering Security and Cryptography
Languages	Korean, English, Japanese, Chinese

obscure location for IT work, accompanied by images of animal-drawn carts and corrupt bureaucrats. A few brave U.S. firms stuck a toe in the water with some small onsite “body shopping” projects and built up slowly from there. Today, India’s software industry is a multibillion-dollar juggernaut on which Fortune 500 and other firms rely for portions of their IT services.

North Korea is not going to follow the same meteoric IT trajectory as India: the challenges it faces are different and more serious. But nor is it a hypothetical or unthinkable destination. Pyongyang already is a base for IT offshoring, the country does have some unique selling points, and is serious about its aspiration to grow this area. You cannot escape the broader geopolitics when dealing with North Korea but, for those who believe nations are reformed by engagement rather than conflict, building IT relationships could be part of a broader path to more general rapprochement that also helps access a low-cost, high-skill talent pool. **C**

Further Reading

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of ignorance and suspicion. It is not well known yet as an outsourcing destination, particularly outside neighboring countries. All the local IT firms have a Web site, but in most cases it is only visible on the national intranet, not externally. This is particularly difficult when trying to compete for attention with firms in other emerging Asian IT locations like Vietnam or Bangladesh, which often have a strong Web presence.

Suspicion of all things North Korean and a “guilt by association” that fails to differentiate the political from the commercial creates a serious barrier for some clients. Perhaps as a result, Europe—where historical relations with the two Koreas are different—may be a more feasible source of partners than the U.S. Certainly the overhanging geopolitical aspects must be acknowledged: there are political tensions, the Korean War has never officially ended, and there are U.S.-imposed sanctions.

Alongside these factors are more mundane barriers—potential clients in the West lack contact lists or even basic information about North Korea. In practice, the country is quite easy to visit, but it is time consuming to obtain a visa, and Pyongyang has few direct international flights and, as noted, limited Internet connectivity. To help cir-

cumvent these difficulties, some North Korean IT firms operate offices abroad, such as in China—there are examples in Beijing, Dandong, and Dalian all staffed by Korean software engineers—through which outsourcing contracts can be undertaken.

Because of the challenges, those who have set up outsourcing arrangements typically do so by working gradually up a “trust and knowledge curve.” This begins with a visit by the client to Pyongyang, holding discussions with potential partner organizations until a suitable one is identified. The next step may be a set of staff exchange visits—a “getting to know you” type of familiarization activity that allows Western clients to understand what North Korea has to offer, and allows North Korean managers to understand what the client needs. Then some small pilot projects are contracted. These may well begin with North Korean staff being brought over to the client site to complete some tightly specified and non-mission-critical IT tasks. Only once this onsite experience has been worked through will the clients move to a more offshore mode of working with their North Korean partners.

Does some of this sound familiar? It should. This is where India was approximately 30 years ago—a seeming