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Korea, Democratic People's Republic of

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Total population	23,301,725 (July 2007 est.)
GDP per capita	USD 1,900 (2007 est.)
Key economic sectors	Military products; machine building, electric power, chemicals; mining (coal, iron ore, limestone, magnesite, graphite, copper, zinc, lead, and precious metals), metallurgy; textiles, food processing; tourism
Computers per 100 inhabitants	NA
Fixed-line telephones	980,000 (2003)
Mobile phone subscribers	20,000 (2004)
Internet users per 100 inhabitants	NA
Broadband subscribers per 100 inhabitants	NA
Internet domestic bandwidth	NA
Internet international bandwidth	NA

(Sources: CIA 2007; Yonhap News 2005)

OVERVIEW

The development of information and communication technology (ICT) in North Korea requires the resolution of international conflicts regarding North Korea's nuclear weapons. In 2007, there were positive signs in this regard, such as improving relations between the United States (US) and North Korea and the second summit between South and North Korea held in October 2007. However, considering the complicated history of negotiations regarding North Korea's nuclear weapons, the situation can be reversed any moment. For example, with the election of the new president of South Korea in December 2007, the South–North relationship in the Korean peninsula has entered a new phase that is different from the one under the previous two administrations in South Korea where cooperation between South and North was considered as something to be maintained at any cost. Furthermore, the relationship between the US and North Korea that until recently seemed to be improving and leading to the verifiable denuclearization of the Korean peninsula, switched into another wave of distrust and hostility in September 2008.

Although there has been little change in the reported¹ digital situation of North Korea since the 2007–2008 edition of the *Digital Review of Asia Pacific*, this chapter reports some changes that have significant implications for digital development in North Korea. These changes include the improving, although volatile, US–North Korea relations, the changing relationship between South Korea and North Korea, the Kaesong Industrial Complex, and the Pyongyang University of Science and Technology.

IMPROVING INTERNATIONAL RELATIONS

It is generally agreed that North Korea cannot make significant progress in ICT development without improving its relationship with the US. This is because the Wassenaar Arrangement established in 1996 bans countries that endorsed it from exporting to North Korea high-technology materials and technologies that can be converted to military use. This international policy can be reversed only when the US removes North Korea from its list of terrorist states. Moreover, North Korea cannot afford the large capital required to build a telecommunication infrastructure for advanced technology industries. This kind of investment can only be infused from the outside. Without the implicit agreement of the US, no country and no investor will make such an investment in North Korea.

Since early 2007, however, there have been significant improvements in the relationship between North Korea and the US. In particular, there has been significant progress in efforts to achieve a verifiable denuclearization of the Korean peninsula through the Six-Party process (Hill 2008). On 13 February 2007, an agreement on 'Initial Actions for the Implementation of the Joint Statement' was reached between North Korea and the US in which North Korea promised to shut down and seal the core nuclear facilities at Yongbyon. North Korea also agreed to invite back the International Atomic Energy Agency (IAEA) to conduct monitoring and verification activities.

On 3 October 2007, the 'Second Phase Actions for the Implementation of the Joint Statement' was agreed upon.

Specifically, North Korea agreed to disable all existing nuclear facilities, starting with disabling the three core facilities at Yongbyon by the end of the year. North Korea also agreed to provide a complete and correct declaration of all of its nuclear programs by the end of 2007. North Korea did not meet the 31 December 2007 deadline for this commitment. If the commitments agreed in the 3 October 2007 Agreement are fulfilled, the US will rescind the designation of North Korea as a state sponsor of terrorism and terminate the application of the Trading with the Enemy Act (TWEA) to North Korea.

Upon the completion of the Second Phase Actions, the Final Phase will be marked by the cessation of North Korea’s existing nuclear programs, dismantling of all nuclear facilities and nuclear weapons, capture of all fissile material produced by North Korea, and verification of North Korea’s denuclearization. In exchange, the US is prepared to resume full diplomatic relations with North Korea.

In May 2008, an official of the US State Department crossed the South–North border with 18,000 pages of documents handed over by North Korea. The documents contain records of North Korea’s plutonium activity, including detailed logs of how much plutonium has been produced. The documents were examined to determine whether they are legitimate and helpful for scientific verification. The turnover of the documents was considered a significant gesture on the part of North Korea to show that it was committed to the negotiation (*Korea Herald* 2008).

North Korea also destroyed the cooling tower in Yongbyon on the 27 June 2008 to show its commitment to the disarmament deal with the US. However, North Korea was not taken off from the US list of state sponsors of terrorism. The US argues that Pyongyang has to agree on the long-delayed verification mechanism. In return North Korea is threatening that it would restore its nuclear plant.

Despite some delay in the complete and correct declaration of all of North Korea’s nuclear programs, the two parties are expected to make progress on the Agreement. For North Korea, an improvement of its relationship with the US and its removal from the list of terrorist states are essential to receive the international aid and foreign investments that it desperately needs for its economic development. For the Bush administration, improved relations with North Korea should repair some of the damage to its reputation caused by failures in the war in Afghanistan and Iraq.²

CHANGING RELATIONS BETWEEN SOUTH AND NORTH

The slowly improving bilateral relations between North Korea and the US served as a backdrop for the 2nd South-North summit

held in October 2007. The summit produced some agreements that can contribute to infrastructure building in North Korea, including the Kaesong Industrial Complex (see the next section).

However, since the election in December 2007 of the new South Korean President Lee Myung-bak, relations between South and North Korea have chilled. The new South Korean administration is very critical of the policy of engagement toward North Korea of the two previous administrations. The previous administrations saw economic cooperation with (or aid to) North Korea as essential to its unification policy, which was named the ‘Sunshine Policy’ because the ‘sun’ of economic benefits would continue to shine on the Korean peninsula even on ‘cloudy’ days marked by disputes. This policy was to help ease the economic difficulties of North Korea and improve the internal relationship between South and North. But the conservative opposition party at the time, which is now the ruling party, had opposed the Sunshine Policy, arguing that the economic aid only helped the North Korean regime to survive its economic hardships and the aid was being used for military purposes.

As soon as the new South Korean government came to power, the president announced that he opposed unconditional assistance to North Korea and called for its nuclear disarmament as a precondition for economic cooperation. North Korea responded head-on to this policy change by expelling South Korean officials from the Kaesong Industrial Complex and test-firing missiles (*The Associated Press* 2008). Considering the hard-line approach taken by both sides, it will take time to return to the cooperative relationship of the last decade. And this is not a favourable situation for the development of ICT in North Korea.

KAESONG INDUSTRIAL COMPLEX

The Kaesong Industrial Complex, a special economic district, is an economic cooperation project between South and North Korea. Kaesong is a North Korean city located just 60 kilometres from Seoul and 160 kilometres from Pyongyang. It has easy access to Incheon International Airport and Incheon Port (Figure 25.1). The complex combines capital and technology from South Korea and the abundant land and labour of North Korea. It began in August 2000 when a contract was signed between Hyundai Corporation and North Korea’s Asia Pacific Peace Committee. In November 2002, the North Korean government released the ‘Regulations for the Kaesong Industrial District’, and in June 2004 the first 15 companies set up their plants. As of July 2008, 72 companies were in operation, employing 30,084 North Korean workers and about 1,300 South Koreans (Kaesong Industrial District Management Committee 2007).

Figure 25.1
Location of the Kaesong Industrial Complex



(Source: Kaesong Industrial District Management Committee 2007)

Currently, the Kaesong Industrial Complex houses labour-intensive manufacturers of shoes, bags and clothes, and similar goods. The plan is to subsequently focus on technology-intensive industries and cutting-edge technology industries, including ICT. For such industries, electricity and telecommunication infrastructure need to be built. At present, the Kaesong Complex is supplied with electricity from Munsan in South Korea by KEPCO (Korea Electric Power Corporation). KT (Korea Telecom) is providing the phone lines. However, Internet access and mobile communication are not available at the complex, which is a source of complaints from South Korean workers and companies.

Although the Internet is recognized in North Korea as increasingly important, only the privileged are allowed to use it. Among authoritarian states, North Korea exerts the tightest control over the Internet. North Korean leaders are concerned about the impact of the Internet on the stability of the regime. However, the North Korean government also recognizes the

potential economic value of the Internet. Thus, it faces the dilemma of whether to court political instability in exchange for economic gains by opening up the Internet. Without opening up the Internet, it will be very difficult to attract further investment from South Korean companies and foreign investors. However, there are some positive signs. During the second summit in October 2007, it was agreed that measures would be taken to ease transportation, communication (in particular, Internet access³ and mobile communication⁴) and customs clearance for the Kaesong Industrial Complex.

It was reported that the Korea Software Financial Cooperative (KSFC) was planning to set up software centres, provisionally called the Korean Peninsula Software Cooperation Centre, in Kaesong and Pyongyang (Kim 2007). KSFC consists of about 1,000 software firms, including high profile companies such as Samsung SDS, LG CNS, SK C&C, and PosData. They expect to use talented North Korean programmers at lower prices and address the shortage of high-quality software engineers

in South Korea. This partnership will earn North Korea the dollars that it needs and allow its engineers to learn advanced technology. Most of all, while working with the South Korean engineers, the North Koreans could develop capabilities in market development that they lack, because they have never been exposed to demands from sophisticated customers. North Korean companies could also tap foreign markets through South Korean companies’ linkages to the world market.

However, it is just the start of the negotiations and it will take some time to open the centres. Thus, KSFC has entered into an agreement with the Pyongyang University of Science and Technology (PUST), which is scheduled to open in 2008 (see ‘ICT Education’), to set up a training centre for software within the PUST campus. The centre will recruit about 100 talented software engineers and focus on practical skills that can be immediately utilized for South Korean software companies.

ICT EDUCATION

Top universities in North Korea such as the Kim Il Sung University, the Kim Chaek University of Technology, and the Pyongyang University of Computer Technology have dedicated units for computer science and software engineering. The focus of ICT education is software as Kim Jong-Il has often emphasized the strategic importance of the software industry in the ‘Single Leap’ of the North Korean economy. The Single Leap strategy aims not for catch-up but for breakthrough (Bae 2001; Hahn 2003; Seo 2001).

However, it is not easy to educate high-quality engineers and develop ICT and software industries without infusion of state-of-the-art knowledge from abroad. In this sense, the opening of the PUST (www.pust.net or www.pust.or.kr) is a promising development. The PUST is the first international university in North Korea, with English as the medium of instruction and staffed by academics from around the world. It is being built on a 100-hectare plot leased by the people’s army. With 45 faculty members, the PUST will offer master courses in computer science, electronics, agricultural engineering, and business administration to an initial cohort of about 150 students. It is expected to have 2,600 undergraduate and postgraduate students.

Its founders envision the PUST as a Silicon Valley-style industrial cluster that would generate jobs and revenue. The university is modeled on the Yanbian University of Science and Technology (YUST) founded in 1992 in Yanji, the capital of Yanbian Korean Autonomous Prefecture in China’s Jilin province, just over the North Korea–China border. The leading founder of the PUST set up the YUST, the 1st Chinese

university jointly founded with foreign participants, and he has been running YUST successfully. Therefore, it is expected that the PUST will be on track shortly. However, some observers remain cautious because of the unpredictability of the North Korean situation. The project has already suffered from several delays caused by missile and nuclear tests and the resulting lack of funds. Nevertheless, despite some concerns, once it is open PUST will become the centre of ICT education in North Korea.

FUTURE OF ICT DEVELOPMENT IN NORTH KOREA

As described in the chapter on North Korea in the 2007–2008 edition of the *Digital Review of Asia Pacific* and partly in this chapter, North Korea has made various attempts in ICT development. However, the ‘Single Leap’ for North Korea’s development is not possible without a dramatic increase of investment in ICT. This kind of investment in ICT infrastructure and the education system has yet to come.

Surely, due to the recent easing of the political tension between North Korea and the USA, the prospect for North Korea’s ICT development will be better than in the past year. However, there are many known and unknown obstacles for ICT cooperation between North and South Korea, particularly with the chilling of the relationship between the two countries. Fewer cooperation projects than anticipated have been implemented. South Korean entrepreneurs and business people do not underestimate the unstable and unpredictable nature of North Korea’s policies. They are reluctant to invest in a country where everything is always unpredictable and where politics overrides business.

In conclusion, it may be predicted that there shall be another set of ups and downs in the North–South cooperation in ICT. As borne out by previous experience, there will be some positive signals as well as some negative developments, at least for the time being. What is clear is that it is very unlikely for North Korea’s ICT sector to be developed without North–South cooperation. Thus, it seems likely that it will take not one but several years for ICT development in North Korea to be realized.

NOTES

1. For example, there is no update on the state of telecommunications infrastructure in North Korea in the *The World Telecommunication Development Report* of the International Telecommunication Union (ITU) and CIA’s *The World Factbook*. It is difficult to get reliable

information on ICT in North Korea and the information that is available is not always accurate. The data reported in this chapter come mostly from media reports.

2. With the 2008 US presidential election, the time for the resolution of the North Korea nuclear issue has run short and the motivation of the Bush administration to make a nuclear deal has weakened. It is likely that the North Korean issue will remain unresolved and it will be handed over to the coming administration.
3. During his visit to Pyongyang, the former South Korean President Roh Moo-hyun was reported to have asked Kim Jong-il whether South Korean companies operating in Kaesong could have Internet access. Kim’s response was, ‘I’m an Internet expert, too.’ He was quoted by the Associated Press to have said: ‘It’s all right to wire the industrial zone only, but there are many problems if other regions of the North are wired. If that problem is addressed, there is no reason not to open.’ He did not elaborate what those problems are (Cheng 2007).
4. Orascom Telecom, an Egyptian mobile operator and the fourth biggest Arab mobile phone operator, was granted the mobile phone licence in North Korea. The company will invest USD 400 million on infrastructure and licence fees over the next three years. The licence is for 25 years, with an exclusivity period of four years (Reuters 2008). The services will use wideband code division multiple access (W-CDMA), a third generation (3G) technology used in South Korea, which implies roaming services between the South and the North. The use of mobile phones was banned after an explosion in the city of Ryongchon adjacent to the border of China in April 2004 (The Dong-a Ilbo 2008).

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