51 Zebral, personal interview, March 8, 2011.

<sup>52</sup> Paulo Sotero, "Brazil and China: Growing Asymmetries, Unmet Expectations and the Limits of Convergence in the Global South" (paper presented at the Conference on Leadership and the Global Governance Agenda, Center for International Governance Innovation, Stanley Foundation and Chinese Institutes of Contemporary International Relations, Beijing, China, November 10-11, 2009).

53 Paulo Sotero, lecture Brazilian national security (course on Brazil in the Global Arena, George Washington University, Washington, DC, April 11, 2011).

54 Wang Xinyuan, "Brazil to Diversify Exports to China," *The Global Times*, May 20, 2009, http://www.globaltimes.cn/www/english/ business/Investment-in-China/2009-05/431338.html (accessed April 12, 2011).

- 55 Xinyuan, "Brazil to Diversify Exports to China."
- 56 Sotero, "Brazil and China: Growing Asymmetries, Unmet Expectations and the Limits of Convergence in the Global South."

57 Sotero, "Brazil and China: Growing Asymmetries, Unmet Expectations and the Limits of Convergence in the Global South."

58 Paulo Cabral, "China to Welcome Brazil's Newly Elected President," *BBC News – Business*, April 7, 2011, http://www.bbc.co.uk/ news/business-13009093 (accessed April 14, 2011).

59 Sotero, "Brazil and China: Growing Asymmetries, Unmet Expectations and the Limits of Convergence in the Global South."

60 Xinyuan, "Brazil to Diversify Exports to China."

61 Andre Soliani and Matthew Bristow, "Rousseff Wants China Buying More Than Soybeans, Vale's Iron Ore," *Bloomberg*, April 10, 2011, http://www.bloomberg.com/news/2011-04-10/rousseff-wants-china-buying-more-than-soybeans-vale-s-iron-ore.html (accessed April 14, 2011).

Andre Soliani and Matthew Bristow, "Rousseff Wants China Buying More Than Soybeans, Vale's Iron Ore."

Raymond Colitt and Ana Nicolaci da Costa, "Geithner Pledges to Work With Brazil on China," *Reuters*, February 7, 2011, http:// www.reuters.com/assets/print?aid=USTRE7160ST20110207 (accessed April 14, 2011).

64 Paulo Cabral, "China to Welcome Brazil's Newly Elected President."

65 Wang Ying, "Costa Rica gets Confucius Institute," *China Daily*, November 19, 2008, http://www.chinadaily.com.cn/cndy/2008-11/19/content\_7217557.htm (accessed April 15, 2011).

66 Amaury de Souza, "Brazil and China: An Uneasy Partnership" (paper presented at the China – Latin America Task Force, Center for Hemispheric Policy, University of Miami, Miami, FL, February 14, 2008). Accessible at: http://www.cebri.com.br/midia/documentos/204. pdf (accessed April 14, 2011)

67 Roett, The New Brazil, 127.

68 Woodrow Wilson International Center for Scholars – Brazil Institute, "Brazil and 'Latin America' in Historical Perspective," press release, March 2, 2010, Accessible at: http://www.wilsoncenter.org/index.cfm?topic\_id=1419&fuseaction=topics.event\_ summary&event\_id=591059 (accessed April 13, 2011).

69 Roett, The New Brazil, 130-131.

70 Roett, The New Brazil, 130.

71 Sotero, "Brazil and China: Growing Asymmetries, Unmet Expectations and the Limits of Convergence in the Global South."

72 Paulo Sotero, "Brazil as an Emerging Donor: Huge Potential and Growing Pains," *Development Outreach*, Volume 11, Number 1 (February 2009), 20.

John Pomfret, "China Invests Heavily in Brazil, Elsewhere in Pursuit of Political Heft," *The Washington Post*, July 26, 2010, http://www.washingtonpost.com/wp-dyn/content/article/2010/07/25/AR2010072502979\_pf.html (accessed April 14, 2011).

- 74 John Pomfret, "China Invests Heavily in Brazil, Elsewhere in Pursuit of Political Heft."
- 75 John Pomfret, "China Invests Heavily in Brazil, Elsewhere in Pursuit of Political Heft."
- 76 John Pomfret, "China Invests Heavily in Brazil, Elsewhere in Pursuit of Political Heft."

77 Vincent Bevins, "Dilma Rousseff Moves Brazil To Centre," *The Guardian*, March 3, 2011, http://www.guardian.co.uk/commentisfree/cifamerica/2011/mar/03/brazil-dilma-rousseff (accessed April 14, 2011).

78 Alexei Barrionuevo, "Leading Brazil, Facing Unfinished Tasks," *The New York Times,* October 30, 2010, http://www.nytimes. com/2010/10/31/world/americas/31brazil.html (accessed April 14, 2011).

79 Fabio Alves and Carlos Caminada, "Brazilian Debt Raised to Investment Grade by S&P (Update 4)," *Bloomberg*, April 30, 2008. http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a86v4f6\_W2Jg (accessed April 14, 2011).

Nouriel Roubini, "Beijing's Empty Bullet Trains," *Slate Magazine*, April 14, 2011. Accessible at: http://www.slate.com/id/2291271/ (accessed April 15, 2011).

Alejandro Barbajosa, "JP Morgan Bullish on China Commodity Demand, Warns on Social Tension," *Reuters*, April 5, 2011, http:// uk.reuters.com/article/2011/04/05/jpmorgan-commodities-idUKL3E7F50FJ20110405 (accessed April 26, 2011).

32 Jim Jubak, "China Creeps Toward a Crisis," *MoneyShow*,

Photos courtesy of:

http://commons.wikimedia.org/wiki/File:Brazilian\_National\_Congress.jpg

http://commons.wikimedia.org/wiki/File:Dilma\_Rousseff\_-\_foto\_oficial\_2011-01-09.jpg

## Information Technology and Control in the DPRK



**Robert Duffley** Bachelor of Arts, English and East Asian Studies Georgetown University, 2013

In the Hermit Kingdom, information is a crucial resource. Its possession represents access to resource and weapons development techniques, but more importantly, information is what separates North Korean society from the rest of the world. Since the state's inception, meager rations of information combined with hearty doses of propaganda have kept the populace starved with respect to knowledge of the rest of the world's progress, which has quickly surpassed their own in the past two decades. Why, then, has the current regime dared implement 21<sup>st</sup> century communications systems such as internet technology if such a move would increase the possibility of an information risk?

I argue that Supreme Leader Kim Jong Il's regime encouraged the implementation of such systems because the technology had been adapted with restrictions judged sufficient to minimize their security risk. Through tracing their implementation in comparison with that of other technologies such as radios and weapons technology, it can be seen that communications systems were given the same treatment as these other potentially societychanging technologies: tailored so specifically to North Korean purposes in accordance with Juche doctrine that their use for any other was thought impossible. However, we can see from examining recent information leaks from within North Korea that these controls may not be as watertight as hoped by their implementors.

In the Western world, where information exchange is a profitable and fast-growing area of the economy, the idea of opposing connectivity is unthinkable. However, in North Korea's case, the question of whether or not to implement information technology, and how to do so, is an important one. To overlook this question is to miss a key opportunity to analyze the highly reclusive state's methods of operation, as well as its current views toward an interconnected world of which it does not participate. Though most news sources have sparingly documented North Korea's recent quiet moves toward implementing internet access, academic analysis of why this technology is being implemented in the first place is limited.

One school of thought on North Korea's steps toward net access proposes that the regime uses extremely limited IT implementation to enforce its control of the



DPRK Guard peers out from behind a granite pillar.

population. A CIA study from 2007 entitled "Hermit Surfers of P'yongyang: North Korea and the Internet" argues that the internet actually "serves as a pillar supporting Asia's



Volume 5 *Issue 1* 

most authoritarian government."<sup>1</sup> The main argument behind this claim is that researchers working abroad or in a few tightly monitored facilities within North Korea access the Internet and essentially strip-mine it for foreign technical information posted there, downloading the information, scourging it of any politically dangerous content, and then sending this data to research facilities, which are responsible for domestic research and development. Before the rise of internet technology, the North had to network, in however limited or parasitic a fashion, with other nations in order to make any scientific progress – as was the case with the USSR and China. Now, however, a single researcher with an internet connection can harvest "vast amounts of information with an ease unimaginable ten years ago."<sup>2</sup> In the view of this study's authors, this method of onesided scientific exchange is much safer for the regime, because it allows the acquisition of information with no dangerous discourse, and the scientists to whom the information eventually makes its way get no exposure



An aerial view of the North Korean capital of Pyongyang.

to the original ideological contexts of these ideas. In all other sectors of society, the report maintains, there is no access to information technology. Since this study, information has arisen suggesting that North Korea recently has been investigating IT possibilities beyond simple data harvesting and the personal enjoyment of key leaders.

In 2003, Kim Jong II Identified three types of fools in the 21<sup>st</sup> Century: people who do not appreciate music, people who smoke, and

people who cannot use the computer.<sup>3</sup> In the same year, North Korea's Kwang Myong intranet went live. Just like the internet accessible to the rest of the world, Kwang Myong, meaning "light," has e-mail and access to various internet sites and is available to at least the more affluent of Pyongyang's inhabitants.<sup>4</sup> Critically, Kwang *Myong* is an intranet, rather than constituting part of the Internet, meaning its computers are connected only to each other, and the network is inaccessible from the outside. Despite these limitations, Kwang Myong represents a big step toward connectivity in the North. In the same year, on the Internet, North Korea launched its own official website, uriminzokkiri.com, hosted on a server in Shenyang, China as if to showcase these advances to the world.<sup>5</sup> This website made headlines in 2010 when it opened a Twitter and YouTube account.

In 2004, there was a step back in communications technology when cell phones were outlawed. This law mainly affected visiting diplomats, because mobile phone use within the country was limited to only the highest officials. However, after years of effort by the Egyptian communications company Orascom, Koryolink, a North Korean-exclusive cell phone network, was launched in 2008. The government registration fee of \$1,000 USD, which had to be paid in foreign currency, served automatically to limit the possession of cell phones to government elites at first, but since 2009, the first year of Koryolink's operation, the number of subscribers has jumped from 69,261 to 450,000 as of April 2011, proving that the consumption of cell phones has broadened widely from society's elite.<sup>6</sup> Cell phone use is still almost exclusively limited to the Pyongyang and Nanpo wealthy, but the fact that this network exists is a large change from years prior.

Since these policy changes, North Korean presence on the Internet has increased quietly. As of March 2011, there are twelve websites whose servers are located in North Korea and another 18 run by the regime remotely from servers in China and Japan.<sup>7</sup> Most recently, and most surprising to observers of North Korea, however, was the long-postponed opening of the Pyongyang University of Science and Technology in October 2010. Pioneered by American evangelical scholars, the university offers a state of the art campus and curriculum to its hand-picked 160 students, including access to the web. This access is censored, but it is real, and thus unprecedented outside Kim's closest circle.

Thus, it can be said with certainty that North Korea has been increasing web access - albeit slowly and cautiously - since the turn of the millennium. But the question remains: why? Why permit this access in a country where even radio stations and televisions remain tuned to official state channels, and where any communication with the outside world is strictly forbidden and treated as a severely punishable security breach? In contrast to other, older analyses, I maintain that it is in the restrictions in the utilization of the new products and services, and not the introduction of the technology per se, that the answer to North Korea's technological ascendancy lies. Re-examining these areas of development, there is a common thread of restriction and monitoring. I find that the DPRK regime permits and continues the implementation of these IT goods and services because it believes it has implemented restrictions on their use adequate to minimize any security risk.

The guidelines for these restrictions can be found in the *Juche* philosophy of selfsufficiency. Unlike the Internet, the *Kwang Myong* intranet links only computers within North Korea. Users have email, but on this intranet they can only email other domestic users, while people on the Internet abroad cannot send messages to the *Kwang Myong* system. By the same token, the internet pages accessible through *Kwang Myong* are screened and, once approved, downloaded from the real internet by regime agents working overseas. Thus, the system is a limited simulacrum of the world net. In the same way, Koryolink cell phones can only call other phones on the Koryolink network. There is no international calling, and data accessible from these phones is an offshoot of *Kwang Myong*. Additionally, anyone who wants to carry a cell phone must pass a rigorous registration and screening process, and is then subject to government eavesdropping and censorship at all times. Again, this cell network is not linked to that of the rest of the world, but is rather a restricted facsimile. The system is automatically selfdefensive, as censorship and oversight are common. In these respects, North Korean IT policy developments to date do splendidly embody the Party's idea of *Juche* in all fields.

Other homegrown copies of outside world tech favorites are also becoming more common. The code that runs the popular Firefox browser has been re-appropriated by the DPRK for their own national browser system. The code and functions are the same, and the original Firefox logo makes an appearance on several of the browser's feature pages, but the product has been rebranded as "Naenara,"



North Korean student during a computer class.

or "Our Country." This browser features prominently in "Red Star OS," North Korea's recently-released Linux-based operating system. Details about the OS are limited to screenshots and descriptions posted online by a Russian blogger studying in Pyongyang,<sup>8</sup> but it has emerged that the operating system plays a patriotic anthem at startup and contains copies of popular programs such as Microsoft Office and games.<sup>9</sup>

Essentially, internet technology was



Volume 5 *Issue 1* 

a new resource treated with old caution. *Juche* philosophy, in its most practicable interpretation, mandates self-reliance. In terms of resources, this doctrine is manifested as a refiguring of resources to be Korean-produced and Korean-used: creating a closed loop. This closure is, of course, antithetical to the internet as the rest of the world knows and uses it, but for North Korea, which viewed the net primarily as a database and secondarily as a method of exchange, this problem was easily solved. In IT terms, *Kwang Myong* is the definition of a closed-loop system.

These first steps towards net connectivity have not resulted in widespread economic success, but they indicate that the leaders no longer are naysaying any internet access due to political fears. More recently, the door has been cracked open wider, most significantly with the recent

## Even ten years ago, most North Koreans had never seen, let alone interacted with, a computer.

opening of Pyongyang University of Science and Technology (PUST). This important event represents, for the first time, the opening of a direct link to the world internet (the real one, not Kwang Myong) that, however restricted, is in the hands of the nation's best and brightest. A triumph for negotiators from the US, China, and South, Korea, the university, now in its second year of classes, enrolls students from North and South, and brings together faculty from all the nations named above. For the first time, Kim Jong II has allowed a hand-picked academic elite to step outside the tight walls of Juche facsimiles in hopes that, with their education, they will help North Korean adaptation to the 21<sup>st</sup> century's new technologies. To what extent these adaptations will extend beyond the elite, and what the effects of this early exposure will be, it is simply too early to say.

That said, there is a genuine possibility that these cracks in North Korea's information block may fracture and widen, opening the way

50

for a distant but possible flood of information. The possibility that even current IT levels pose a risk to the regime arises from from data on consumer trends and recent events where communications technology was used explicitly against the regime.

The first consequence of IT implementation, even at its current limited extent, that represents a risk for the North Korean government is the simple familiarity with technology that comes as a natural consequence of exposure. Even ten years ago, most North Koreans had never seen, let alone interacted with, a computer. Now, with Chinese-made computers being sold to the wealthy in Pyongyang, most citizens of the Worker's Paradise have some idea of the machines and their capabilities. Computer education is becoming a key part of North Korean schooling, and those students with exceptional promise have an opportunity to study further at "Computer Genius Training Centers."10 Graduates of these centers may be sent to work in the research sector, or in development of products like Red Star OS that will in turn increase exposure to the internet within North Korean society.

Even on a limited scale, computers have become a non-trivial part of North Korea's economy, a step up from ten years ago, when they were merely a personal plaything of Kim Jong II. In 2006, "Silver Star 2006," a computer game made in North Korea, went on sale in the South,<sup>11</sup> while in 2005 a South Korean company released the film *Empress Chung*, co-animated by a team in the North.<sup>12</sup> Diplomats even report that more and more business cards – not just Kim Jong II's, as in 2000 – carry email addresses, meaning there is a real link to communications technology to the outside world maintained somewhere within the DPRK's murky industrial sector.<sup>13</sup>

On a basic level, North Korean society is becoming more and more familiar with computer technology. The first North Korean internet café (connected to *Kwang Myong*, not the real web) opened in Pyongyang in 2002, and others have opened since, some even outside the capital.<sup>14</sup> They boast computer games popular with children, access to email, and even online dating.<sup>15</sup> All the computers in these cafés perhaps predictably open to the North Korean government homepage, where old propaganda takes a new digital form.<sup>16</sup>

In the mobile phones sector, the scenario is much the same. South Korean unification minister Um Jong-Sik cited in 2010 that the North currently had an estimated 450,000 cell phone users.<sup>17</sup> As documented above, these phones are limited to use within the country and can only access the domestic intranet. However, their popularity and the industry's rapid growth (the number of Korean cell phone users rose 50% from 2009-2010)<sup>18</sup> demonstrate that, again, there is a definite demand for, and growing familiarity with, these communications products.

Importantly, it is this familiarity that holds daunting possibilities for the regime's future security. These technologies were originally allowed because they were restricted to DPRK-only use, with no possibility for connection to the opposite world. These restrictions work - there is no way to reconfigure a Koryolink phone to dial internationally or to connect to the Internet from within *Kwang Myong*. But because these products are simulacra of products popular in the outside world, their operation is almost identical. If someone familiar with the workings of a Red Star computer were granted access to, say, a Chinese or South Korean computer, he would be familiar enough with the technology that he could work it. By the same token, anyone with mobile phone know-how honed by practice with domestic products would also be quite prepared to use foreign phones with unrestricted capabilities. With 450,000 cell phone users in the country at the time of writing, this familiarity would be hard to stamp out even if the regime changed its mind. As use expands, it is experience with these products and not their *Juche* manifestations that marks IT's biggest threat to the Korean regime. These risks have already been realized in several cases. Most prominently, North Korean informers have recently come to use their domestic phone knowledge to send information via Chinese cell phones, which have no *Juche*inspired restrictions. Smuggled at great risk through the North Korea-China border, the phones operate on prepaid SIM cards capable of calling and texting defectors working to collect information from China. When used near the Chinese border, these phones are even said to be able to receive Chinese internet signals.<sup>19</sup> Information from the users of these cell phones has been revealing and important.



Students working in the Grand People's Study House.

According to one *New York Times* article, news from these informants constituted the first information about North Korean outrage over the currency reevaluation enacted in 2009.<sup>20</sup>

Before cell phones, there were indeed defectors who came to China or the South bearing important information about happenings in the DPRK. But the two-way properties of the internet, with informers in the country reporting to defectors on the outside, is a truly revolutionary development. In previous cases, defectors could only provide what information they could bring with them when they exited the country, and returning as a spy was almost completely out of the question. Now, however, thanks to this technology, these networks have constant updates from within the country, which can continue indefinitely. It is estimated that as many as 1,000 of these smuggled phones are currently in use within the DPRK.<sup>21</sup> The reports

Volume 5 *Issue 1* 

come from individuals not likely to have any special knowledge about or access to North Korea's gravest threats to the outside, such as its nuclear program or the question of Kim Jong-Il's successor, but the mere presence of reports from within the country is a major change from only a few years prior.

The regime is aware of these threats. Smuggling across the Chinese border has been a problem before the rise of cell phones, but this new commodity has prompted speculation and the implementation of policies that appear anticipate a crackdown. In the wake of the recent revolutions in Egypt and Tunisia, in which cell phones and internet technology played an unquestionably vital role, North Korea's leaders were visibly concerned. Just after the revolutions broke out, Pyongyang required both institutions and households to report on how many tech devices they owned. This drive included computers and cell phones but extended even to USB flash drives and MP3 players.<sup>22</sup>

This measure indicates a great deal about North Korea's own technological selfawareness. First of all, it is certain that such devices exist outside the highest levels of government. The inclusion of flash drives and MP3 players indicates a consumer sophistication beyond that of most analyses, which, as noted above, hold to the outdated idea that technology has almost no footing in modern North Korean society. Though it is foolish to assume that anyone outside the Pyongyang and Nanpo wealthy has access to an MP3 player, it is interesting that anyone at all should have access to these devices. Are they a gift of the beneficent and omnipotent Worker's Party, or the first black market trickles of a powerful economic sector into an economically isolated society?

measure to register technology is a huge departure from policies of just seven years ago. In 2004, the government's response to a bomb blast along train tracks that missed Kim Jong-II was much more extreme. A cell phone

was found among the rubble, and the regime promptly banned all cell phones within the country's borders, including those carried in by diplomats.<sup>23</sup> It is speculated that the regime suspected the bombers of using cell phones to coordinate or even detonate the blast. This reaction reveals a fundamental shift in policy in recent years motivated by a deepening integration of these technologies into North Korean society. This technology has taken a substantial hold in North Korean consumer markets – to the point that the regime cannot easily change its mind and go backwards. In fact, given growth rates for the past vears, it is safe to assume that North Korean consumers will expect increasingly attainable telecommunications products. If the state does not cooperate with these demands, it has been shown that determined citizens will turn

## The two-way properties of the internet, with informers in the country reporting to defectors on the outside, is a truly revolutionary development.

to the black market despite harsh penalties, and these products from China do represent a substantial danger to the regime's information control.

Future analyses of the domestic situation in North Korea must embrace and investigate further the notion that North Korea is no longer a total information blackout: there are pinpoints of access, even if they are guarded and small. No longer will it be accurate to depict the DPRK as having no interest in connecting with the outside world.

For governments and organizations working from the outside to improve human rights in North Korea and defuse a possibly Even more importantly, this recent explosive collapse of the regime, these connections should be monitored closely. Policy-wise, these organizations should continue existing campaigns to provide information to North Korea's citizens, but the beginnings of internet access in North Korea

offer a key opportunity for change: existing methods of floating in AM radios or brochures into the country have proved to be the most effective way to get these resources into the reclusive country, but they have also proved to be dangerous. If average citizens come upon these parcels or leaflets by chance, they are automatically placed in grave danger of being caught with the devices, or even of being punished for simply having seen them. These offenses have repeatedly proved punishable by transport to a labor camp or death. The recent appearance of North Korean IP flags on international news sites shows that there are individuals in North Korea looking for information on the outside. Concentrating on novel ways to target information to these individuals, who are already looking for it though conscious of the danger, is perhaps a safer and more advantageous strategy made possible by this technology.

In other spheres, governments should find new and meaningful ways to support projects for continued IT development in the DPRK. The Hermit Kingdom has showed it is at least interested in progress in this sector, and IT development has been a key method of new and constructive discourse. The most prominent example is the recent opening of the Pyongyang University of Science and Technology. The project was spearheaded by a Christian group, but the US State Department was deeply involved in funding and overseeing the program's development, including oversight of individual class syllabi. Any projects like this, that increase North Korean exposure to information from the outside, should be viewed as key opportunities for discourse. PUST's prominent advantage is that it grants the internet as an educational tool to 160 of North Korea's brightest students. Through one investment, the outside world now has 160 possible contacts - not in fields of intelligence or espionage, but in the fields of outside knowledge, perhaps even included lightly censored current events. That is a high return for any single investment.

In conclusion, both investors and governments should insist to the regime that increases in communicative potential are a valuable resource, regardless of their use. These sales pitches can easily be accompanied by small policy carrots that convince the regime that it stands to profit from wider access to world communication. The fruits of these connections will likely come naturally once they are established, so the current focus should be on establishing new connections, rather than on manipulating existing ones.

Given its many anomalies (students and faculty from multiple nations, full web access), it is possible that these strategies are already beginning to be effective at PUST. The university doesn't fit clearly into the Juche facsimile structure observed primarily between 2000 and 2010, with the university's openings. With the freedoms it delivers, and the international partnerships central to its existence, the university is no facsimile. Kim Jong II has proved nothing if not mercurial, but at the moment, the university represents a genuine academic foothold in the ascent to widened DPRK web access. With no degrees awarded yet, the university has not had any tangible effects, either with respect to economic or civil advancement. Its opening, however, realized in October 2010 after seven years of delay, shows that the DPRK may be edging into a new approach to IT and out of a Juche-based system in use for the past decade whose contours are only just beginning to become clear.

53