# JOINT U.S. - KOREA ACADEMIC STUDIES

## EMERGING VOICES

VOL. 22

KEI KOREA ECONOMIC INSTITUTE
한 미 경 제 연 구 소

2011 SPECIAL EDITION

# Joint U.S. - Korea Academic Studies

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# New Trends in North Korea

# Selling North Korea in New Frontiers:
## Profit and Revolution in Cyberspace

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## INTRODUCTION: THE DEBATE ABOUT CYBERSPACE

When the Internet became accessible to the international public in the 1990's, it forever revolutionized the way people exchange information and communication. Demands for connection to the virtual world spurred global economic growth as new firms emerged to supply wanted products and services. And as commercial transactions became possible online, the Internet transformed into a legitimate economy, enticing highly authoritarian regimes such as China and Cuba.

Closed off from most physical economies, connection to the virtual economy offers North Korea the opportunities it so badly needs. Indeed, the many benefits of the Internet beckon to the core of North Korea's needs: access to foreign investors, consumers and free information. The DPRK has long since felt the need to access investors and consumers, which was again recently emphasized in the 2010 Joint New Year's Editorial: "we should gain access to more foreign markets, and undertake foreign trade in a brisk way."[1] The Internet allows unprecedented reach to a larger reserve of foreign currency through a wider base of investors and consumers.

It may also provide a method of bypassing the various economic challenges created by sanctions and cooling political relations. Simultaneously, unlimited access to open source information available online is critical for North Korea, which largely missed out in the transfer of knowledge that occurred around the world. The wealth of information available in cyberspace provides the State a means to fulfill its general development strategy known as the "Single-Leap strategy," which will modernize the North Korean economy and bring it up to the standards of the information age.[2]

And yet, connection to the Internet also presents the regime with a dilemma: the spread of outside information could cultivate an opposition force that could threaten the stability of the regime. As with other totalitarian states, the North Korean regime has staunchly controlled the information accessible to its people in order to maintain political loyalty and social stability that it built on a façade of a North Korean paradise. In more recent times, total control has become challenging with the rapid spread of outside information through new platforms such as TVs and DVD players as well as new means of distribution. In response, the government has attempted – rather unsuccessfully – to hinder its people from accessing such information by enforcing various forms of punishment. The Internet provides an even larger threat to the regime because it is a limitless information database that would allow the user to find whatever information he desires. This characteristic differentiates the Internet and its potential from other sources of information, such as foreign radio, which despite many years of broadcasting is still learning the preferences of its listeners. In essence, accessing the Internet allows the user to transform from a passive information recipient to a proactive information seeker, which is an act of increased autonomy and freedom.

North Korean authorities are very aware of the vitriolic potential of Internet access, and the political instability that may ensue. Being a rational actor, Internet connection would only be pursued if the benefits outweighed the costs; more specifically, this would mean the implementation of adequate and successful

methods of information control. Such a strategy would not stray from the general policy approach North Korea has generated for science and technology, an overall "vertical consolidation and horizontal restriction" of the development's application and influence.[3] A guarantee of information censorship would render a simple conclusion to this cost benefit analysis: pursue Internet connectivity for its overwhelming economic benefits. Cyberspace could be an opportunity for North Korea to reap economic benefits without sowing political and social costs.[4]

The final decision to pursue such a potentially debilitating, widely impacting revolutionary tool would require the support of North Korea's three major decision-making bodies: the Korean Workers' Party, the Korean People's Army, and the cabinet. As McEachern convincingly notes, each has views driven by differing purposes: ideological stability for the party, state security for the military, and economic survival for the cabinet. Though these motivations can lead to varied positions, it is easy to reach a consensus about the Internet because each can uniquely benefit from it. The party will find satisfaction in a new virtual territory for ideological revolution, a new addition to Kim Il-Sung's concept of the "Three Revolutions" at home, in the South, and in the rest of the world. An uncharted territory in combating imperialism, cyberspace provides the party a fourth frontier to continue struggling for revolution. For the military, the Internet may present a threat, but concurrently guarantees its continued presence and significance within the system. In addition, the Internet provides the military a new space to be active through modern, scientifically and technologically advanced tactics. Kim Jong-Il himself has stressed the importance of electronic warfare as the "key to victory in modern warfare."[5] Lastly, the cabinet can be convinced of the Internet's benefits given its profit making and image improving potential. With all three actors in agreement over its promise, North Korea has consolidated the political will to venture into a new frontier.

## GETTING CONNECTED

North Korea cautiously ventured into the virtual world. South Korean experts agree that North Korea's experimentation with computer networking systems, or an internetwork (now known as the Internet) began in the early 1990's. At the time, a domestic internetwork connected about 100 main government institutions[6] including North Korea's Academy of Sciences, Korean Workers' Party, Kim Il Sung University, and Kim Chaek University. These institutions connected and exchanged information through a local area network, first through telephone lines, and then through fiber optic cables in the late 90's. Eventually, major cities outside the capital were connected with Pyongyang.[7] [8]As of 2004, most individuals who could afford access used dial-up, resulting in references to networks according to their telephone area code, such as "170 Network" in Pyongyang.[9] A defector the author interviewed claimed that intranet access at individual homes was halted in the mid-2000's.[10] These endeavors were possible through external assistance, such as the UNDP sponsored fiber-optic cable factory, built at North Korea's request.[11] While research and development for a nationwide LAN network began in the mid 1990's, a sparse but nationwide

LAN system was completed in October 2000.[12] The network of fiber optic cables was expanded to the city and district level in 2003,[13] and this countrywide LAN, or WAN (wide area network), resulted in significant improvements in nationwide knowledge sharing. It increased communication and information sharing between the 1,300+ institutions connected through the intranet known as "Kwangmyong," meaning bright light.

"Kwangmyong," developed by the Central Information Agency for Science and Technology (CIAST), began offering trial services in late 2001, and officially began services for the public in November 2002.[14] It provides email service, a messenger program, a file transfer function and a document search engine[15] [16] of over tens of millions of records compiled by over 600 staffers.[17] In 2004, CIAST's Computer Center head Ri Hyok claimed "Kwangmyong" had 10,000 subscribers.[18] Though subscription is free, users must pay telephone charges for usage, which one scholar found to be about five-six won for every three minutes, unaffordable by average workers with monthly wages of 2,500 won.[19] "Kwangmong" has revolutionized learning in North Korea, saving scientists travel time to the capital in order to access technical data.[20] However, its access has been limited to the elite due to its telephone usage costs, and the deteriorated state of North Korea's telecommunications networks has inadvertently limited access to intranet usage.[21] One report found that connection in a Pyongyang Internet café occurred at speeds of 7 to 8Mbps despite capacities of 100Mbps.[22] Egyptian telecommunications giant Orascom's installation of a fiber-optic network in the country[23] may resolve these problems. Disregarding connection quality, North Korea's infrastructure suggests that the basic foundation for nationwide connection to the greater virtual world is complete.

Around 2000, North Korea began to experiment with connecting its domestic intranet with the external Internet environment. By then, most major agencies and institutions in Pyongyang were connected to the global Internet via Beijing, through telecommunication lines specific to this purpose.[24] Efforts were made by Korea Post & Telecommunications Corp (KPTC) to collaborate with the U.S. firm STARTEC in 2000 and the South Korean firm Bit Computer in 2001 to further develop North Korea's telecommunications infrastructure, but they were not fruitful. North Korea's registration into the Society of Worldwide Interbank Financial Telecommunication (SWIFT) in November 2001 also signaled that the DPRK was preparing for worldwide connection.[25] This opening to the outside world came at a time when the winds of reform were in the air, evidenced by the legalization of markets in 2002.

North Korea's first official website is generally accepted as Korea Central News Agency's Japan based website, founded in 1997. Unlike this propaganda-focused website, Korea Info Bank was the first website to focus on commercial services. Launched October 10th, 1999, and in celebration of the Korean Workers' Party,[26] this website was hosted in China and focused on securing investment and economic cooperation.[27] The first official DPRK website to offer international email service was Silibank, operated by the government-affiliated Korea 6.26 Shenyang Company (also 6.26 Technology Center).[28] Launched in October 2001,

Silibank provided registered users email services once a day,[29] until a direct line was installed between China and North Korea in November 2003, allowing 24-hour email services.[30]

An array of governmental bodies, educational institutions, and enterprises are involved with North Korea's intranet and Internet activities. Some include the Ministry of Posts and Telecommunications, National Academy of Sciences, Pyongyang Information Center (PIC), the CIAST, Kwangmyong IT Center, Korea Computer Center (KCC), Kim Il-Sung University, Kim Chaek University, Unha Corporation, and Korea Roksan Trading Company, which has an IT Development Centre.[31] Companies such as the PIC, Kwangmyong IT Center are known to have "hundreds of staff," but the largest IT company in the country is the KCC.

KCC is a state-owned company formed in 1990 that currently boasts a workforce of over 1000 employees,[32] 2,500 computers, and ISO-9001 Certification.[33] Headquartered in Pyongyang, it has 11 regional branches in each province, overseas branches in Germany (location of KCC Europe),[34] Beijing, and Dalian, China[35] and affiliate offices in Syria and the Arab Emirates.[36] KCC is comprised of 10 software development centers for different sectors, which have separate quality control centers (Table 1). The KCC complex includes the KCC Information Technology College and Information Technology Institute to train its workforce.[37] Its main functions are the research, development, distribution, and service of software, education and training of specialists, portal website management, import and sales of hardware, and IT policy and resource management consulting.[38] It claims its immediate goal is to reach "the world standards and clinch a place in the world market in the coming few years in the development of Linux-based operating system and applications, computer-aided high technology and services."[39]

## CURRENT TRENDS IN DPRK INTERNET ACTIVITIES

Currently, Internet in North Korea is only accessible to foreigners and the most elite North Koreans. Varying reports offer different estimates on the actual number of North Koreans who can directly access the Internet, but there seems to be agreement on a maximum estimate of a few thousand North Koreans.[40] [41]Despite the lack of a large user base within the country, more than ten years of Internet experience has produced some notable changes.

First, there is a move for greater presence and autonomy online. This is signaled by a proliferation in the number of official North Korean websites. According to the website North Korea Tech, the current count is 51 websites for various sectors of the DPRK,[42] though some are not official government administered websites. Though all websites were previously hosted on foreign servers, the recent establishment of a server in Pyongyang has lead to direct hosting for 12 of these 51 DPRK websites. Some of these 12 were previously hosted by the German branch of the KCC, but were switched to Pyongyang's server in late 2010 and early 2011, while other websites like Voice of Korea were hosted in Pyongyang from the start. Websites connected in Pyongyang were given

| Table 1: List of KCC's Software Development Centers | |
|---|---|
| **Center** | **Focus** |
| | |
| Osandok IT Center | Operating system |
| Pulgunbyol IT Center | |
| Mangyong IT Center | Network and communication |
| Oun IT Center | Information security |
| Samilpo IT Center | Office automation and artificial intelligence games |
| Chongbong IT Center | Language information processing |
| Sobaeksu IT Center | Control System |
| Milyong IT Center | Medical diagnostic equipment;biosignal processing |
| Samjiyon IT Center | Multimedia; created award-winning game, "Paduk" |
| Naenara Information Service Center | Operates main portal website in DPRK, "Naenara" |
| Source: Former Naenara website, accessed through http://web.archive.org | |

".kp" addresses bought from the Internet Corporation for Assigned Names and Numbers (ICANN) on September 2007.[43] The ".kp" domain name was originally registered under the Korea Computer Center with its administrator registered as KCC Deputy Director Chang-ryup Kim, and its technical contact as Jan Holtermann of KCC's European branch.[44] However, on May 2, 2011, the domain's registration information was revised and registered under Star Joint Venture Company.[45] With a block of 1,024 IP addresses reserved,[46] the introduction of new North Korean websites can be expected in the near future.[47]

Second, North Korean websites have become more technically advanced and aesthetically pleasing. One example is the recent makeover of Korea Central News Agency's website, begun in late 2010. Compared to the previous website, the new design layout is more modern and resembles other foreign news websites; articles have been better organized for easier search. The website also features many more photos and even videos that can be watched from an imbedded media player. Naenara, a website managed by the Naenara Information Center of the KCC promoting North Korean ideology, culture, and economy, has recently undergone a similar modernization. Another notable website is Ryomyong, which claims it can be viewed from a mobile phone. Compatible on eight different mobile brands, the mobile version of the website has three main categories, including music, photos of the DPRK, and news articles by Rodong Sinmun, KCNA, and Minjok Joseon.[48]

The third and most interesting trend in North Korean online activities is a serious move towards utilizing the Internet for economic profit. The DPRK has benefited greatly from open source information available online, but its economic and profit-seeking endeavors have been limited. A review of early government-affiliated websites reveals that it indeed attempted to use the Internet for increased profit (refer to Table 2). More specifically, the websites either attempted to attract foreign investment, sell products, or draw tourists.

The website Korea Info Bank, founded in 1999, attempted to attract economic cooperation and investment, offering information in four languages.[49] From 1999 until 2008, with the exception of 2005, North Korea founded at least one website per year related to economic activity.[50] In addition, more than half the websites listed on North Korea Tech's directory of North Korean websites have information on business in North Korea or directly sell North Korean products.

**Table 2: List of North Korea's Profit Related Website**

| **Main websites constructed for the purpose of Economic activity** | | |
|---|---|---|
| Date Founded | Website Name | Main Content |
| 1999 Oct. | Korea Info Bank [dprkorea.com] | PR to attract economic cooperation and investment |
| 2000 July | Pyongyang Times [times.dprkorea.com] | Advertisements of businesses in the economic sector |
| 2001 Sept. | Silibank [silibank.com] | Website for business (e.g., mediating email) |
| 2002 Jan. | Korea Tours [dprknla.com] | Information to attract tourists and businessmen |
| 2002 Dec. | Korea Trade [dprkorea-trade.com] | Online shopping mall for foreigners |
| 2003 Feb. | Cholima Group [cholima-group.com] | Targeted foreigners for trade |
| 2003 July | Korea Friendship Association [korea-dpr.com] | Aimed at selling North Korean products |
| 2003 Nov. | Pyongyang International Information Center [pic.international.com] | Sells software produced by the Pyongyang Information Center |
| 2004 May | Korea Pugang Corporation [pugangcorp.com] | Sells medicine and medical supplies from the Corporation |
| 2004 June | Naenara [kcckp.net] | Multi-purposed website with info on IT, trade, product sales |
| 2006 Feb. | Chollima [dprk-economy.com] | To attract foreign investment; has online shopping mall |
| 2007 June | Ryomyong [ryomyong.com] | PR: literature, art, history, DPRK trademarks, info on Mt. Paekdu |
| 2008 | Arirang [dprk-tour.com] | Info for mass games tours, DPRK culture and investment |

**Website states founding as November 2000.
Source: Lee, Hae-jung, 2008

The combination of these trends presents strong evidence of a shift in North Korea's online strategy.[51] Specifically, it reveals a firm belief in the economic potential of the Internet and renewed determination to attract investors. It is clear that North Korea intends to take advantage of the cyber economy by strategically marketing online for commercial purposes. [52]

## MARKETING 101: KNOW YOUR CUSTOMER

Successful acquisition of foreign currency requires effective marketing to potential customers. In this regard, North Korea seems to be implementing a two-pronged approach of targeting consumers based on purchasing power. For individuals with limited purchasing potential, the DPRK has focused on public diplomacy by selling ideology and culture. For large-scale investors, emphasis has been on promoting North Korea as a safe and attractive investment opportunity.

### Individuals

North Korean websites targeting individuals have focused on improving people's perceptions of the country by presenting information to form a multi-dimensional image. As such, North Korea seems to be selling "revolution" to individuals in cyberspace. One way it can improve its image and increase the number of its supporters in the virtual community is by utilizing modern modes of communication. North Korea's engagement in social media, namely Twitter and YouTube, has attracted the attention of the tech-savvy populace, garnering a total Twitter following of over 11,500 followers. Videos posted on the Uriminzokkiri YouTube account include news and editorials, but also many cultural programs and music videos providing more contexts for understanding North Korea.[53]

Individuals can also surf North Korean websites to view North Korean products, including tours, VCDs of the Mass Games, music CDs, postcards, books on Kim Il-sung's writings, and photos. Ideology is promoted on items such as mugs, shirts, and bags imprinted with North Korean propaganda art. Though the exact figures of profit from these goods are unknown, one can guess their insignificance given low demands for Wangjaesan Light Music Band VCDs and Chollima badges. However, demand for tours to North Korea has risen, resulting in increased availability and diversity of tour packages through tour agencies like Koryo Tours and Young Pioneer Tours. A state-owned travel company called the Korea International Travel Company is said to exist, but very little information is available.[54] Increased outside interest may be the reason for internal efforts to capitalize on tourism by loosening regulations, allowing new destinations for increased access into the country,[55] [56] and by permitting unique tours. One such tour included participation in the first North Korean Amateur Golf Open, played on the country's only golf course.[57]

The Korean Friendship Association website (www.korea-dpr.com) is interesting because despite not being an official government website, having been created early on in North Korea's cyber history (no doubt with close input from the North Korean government), it is still functioning today. The Korean Friendship Association is an organization founded to build international ties with North Korea, its objectives include "showing the reality of the DPRK to the world," defending the DPRK, learning from the people's culture and history, and working for peaceful unification. The evolution of this website exemplifies the two-pronged approach of targeting different consumers. For individuals, the website sells North Korean propaganda products and ideology. Utilizing a website archive tool such as web.archive.org, one can trace the website back to prior years. It was found that

in 2003, the website had a sparse three-item DPRK souvenir shop but by late 2007, the souvenir icon redirected the user to a separate KFA Shop website with an impressive array of North Korean propaganda goods. Table 3 shows a basic market basket reflecting some of the changes in the KFA shop over time, namely the increasing number of designs available and price fluctuations of a few items. More recently, souvenirs are available on two different websites depending on the category of the product desired. In addition to goods, KFA began providing free membership to interested persons in 2008. By January 2009,[58] though membership was still free, members could purchase a physical membership card for 50 Euros. Associated by common beliefs, members are in essence a virtual "United Communist Front": a new revolutionary "army" in cyberspace.

**Table 3: www.cafepress.com/kfashop**

| Date | Number of Designs | Cost of Propaganda Model 1 Light T-shirt | Propaganda 9 Greeting Card (1) | Propaganda 9 Greeting Cards (10 pack) |
|---|---|---|---|---|
| Oct. 2007 | 9 | $ 26.19 | $ 4.39 | $ 26.19 |
| Mar. 2008 | 9 | $ 26.19 | $ 4.39 | $ 26.19 |
| Feb. 2009 | 11 | $ 22.49 | $ 4.39 | $ 22.49 |
| Sept. 2010 | 13 | $ 22.49 | n/a | n/a |
| Apr. 2011 | 13+ | $22.49 | $ 4.49 | $ 22.49 |

## Investors

Selling North Korea to foreign investors has required a different approach than for small-scale consumers. Rather than stressing ideology and culture, a pragmatic business approach has been pursued to attract foreign investment. North Korea has attempted to market the country as a profitable and secure investment by highlighting economic incentives, its large population of highly skilled but low wage labor, sound institutional support from the DPRK government, and a legal system that guarantees investors rights. The efforts of these profit-driven websites have been buttressed by various official news agency websites that release reports on issues that affirm the above factors.

The KFA website states that North Korea will soon become the "most important hub for trading in North-East Asia" with economic incentives including the "lowest tax scheme in Asia and lower overhead costs due to no middle agents." Labor is described as the cheapest in Asia and the laborers "highly qualified, loyal, and motivated" because of free social welfare in the country.[59] North Korea's political environment is described as "stable," no doubt to address investor concerns regarding the political volatility of the region. The Business page of KFA's website introduces the International Korean Business Centre (IKBC), the "comprehensive one-stop service" for those interested in investment opportunities. A link is also provided to an Exports page offering PDF files with more detailed information about industries available for investment. This is a

drastic change compared to the information available previously: in 2001, the website offered no business information; in 2002 a business page provided little practical information. It was not until about 2008 that the business page was completely revamped with useful investment information.

KFA also emphasizes the North's transparent legal system, also stressed on other websites. KFA publicizes the DPRK's three major foreign investment laws, The Law of the DPRK on Foreign Investment, The Law of the DPRK on Equity Joint Venture, and The Law of the DPRK on Contractual Joint Venture. Though the main text of the laws are not available, the website Naenara does summarize them, highlighting incentives for investment and addressing potential concerns such as state seizure of assets, dispute resolution processes, and investor protection by the state.[60] Furthermore, KCNA has continued to report on legal developments of interest to investors. As recent as April 7, 2011, KCNA reported that government officials in all fields attended a two-day seminar that addressed the importance of copyrights in an "era of knowledge-based economy in the 21st century."[61] Also, North Korean news websites have reported on the visits of foreign investors to the country, perhaps to give the impression of large interest. KCNA reported on the visits of Orascom CEO Naguib Sawiris, Schulze Global Investments Ltd. CEO Gabriel Schulze,[62] and Reto Wittwer, President of the Swiss Kempinski Hotel Group.[63]

## IMPLICATIONS

North Korea's Internet developments and overall online strategy can seem surprising and sudden, but as examined above, North Korea has carefully and continuously planned this process for the last two decades. These efforts have had interesting internal and external impacts.

### Internal Impacts

Domestically, it is possible to see a North Korea undergoing modernization. North Korea has prioritized advancing science and technology in the country, introducing new technologies such as computers and mobile phones, and building the infrastructural capacity for them. The Internet is clearly a part of this modernization, and North Korea has steadily built its capacity for its online activity. It is true that serious financial challenges restrict nationwide availability for various telecommunications equipment required for connectivity,[64] but the investments mobile service provider Orascom have made to North Korea's telecommunications infrastructure for mobile service look to have positive impacts also for Internet capacity. Something to watch for in the future is how new technologies develop and intertwine in their functions and capabilities. For example, will intranet access be available on official mobile phones one day? Ultimately, the development of these advanced technologies will serve both practical functions and propagandistic functions for domestic and international audiences.

Opportunities to connect to the intranet are currently limited to the mostly wealthy elites at intranet cafes such as the one operated by the Chumdan Technology Center. Known as North Korea's first indigenous intranet café, it is located near Kwangbok subway station and holds approximately 100 computers.[65]

It is said that every computer is in use during the hours of 3pm to 7pm when university classes are over.[66] Though access is extremely limited, this group of intranet users is significant because it suggests the budding formation of a new information culture in North Korea. It suggests that a growing number of North Koreans are learning new methods of sharing and receiving information. The Intranet is significant in that users are becoming proactive information seekers.

A new information culture is being formed through both increased incorporation of technology in academic settings and increased domestic and regional knowledge transfer. Beginning with the most elite and well-funded academic institutions, an increasing number of universities and schools are attempting to integrate technology. Again, while the technical capacity is certainly unequal across the country, this suggests that there is an effort to cultivate a new generation of technologically savvy North Koreans. In theory, this implies that if economic circumstances permitted the execution of North Korea's current policies, young North Koreans would develop the skills to utilize new technologies. Given North Korea's authoritarian nature, it is highly likely that this may not be the case even if it was technically possible, thus limiting the Internet's impacts on the majority of the North Korean people.

Furthermore, the intranet and new technologies such as distance learning[67] have provided unprecedented ways to decrease the regional knowledge gap and accelerate overall academic standards throughout the country. To what extent the regional disparities in educational quality will decrease through such channels remains uncertain given the aforesaid infrastructural problems and regionally manifested sociopolitical hierarchy. Nonetheless, anecdotal evidence from foreign businessmen seem to suggest that North Korea's emphasis on science and technology has provided new opportunities for some highly qualified people from the rural areas. One businessman noted that the one upside to Asian subcontracting was the opportunity for upward mobility given to those already possessing skills.[68] One new North Korean supervisor had "obviously made it to Pyongyang on the merits of his talent," allowing him to leave his rural home for a privileged life in the capital.[69]

North Korea's investments into its highly skilled technical and management personnel reveal that it greatly values such talent. Not only do these talented resources speak foreign languages,[70] a substantial number have degrees from abroad.[71] While some scientists are given access to visit the outside world; others are permitted Internet access to study open source materials, albeit with heightened security protocols.[72] As Mercado points out, this allows gathering the latest technical information "without sending people abroad or bringing Westerners in," which can help maintain political stability.[73] These risks have had side effects such as defection while working or studying abroad, but they have also been fruitful. The work of scientists such as Dr. Hwang Tok-man who utilized the Protein Database of the U.S. Department of Energy's Brookhaven National Laboratory to produce significant results on the structural and functional analysis of proteins is such an example.[74] Another is "Red Star," North Korea's first indigenous operating system based on the open source software, Linux.[75]

## External Impacts

A review of North Korea's activities in cyberspace reflects North Korean understanding of a western, capitalist system and how to navigate in it. This is evident in its awareness of the power of image and its understanding of basic free market principles. Its activities and trends online show an increased awareness of the rest of the international community and its image outside of the Korean Peninsula and its immediate neighbors. North Korea's marketing methods on its websites reveal understanding of the importance of advertising;[76] it is aware that investors are attracted to politically stable environments with transparent governments in good standing with the international community, and has described North Korea as such a place. It is evident that recent modernizations of North Korean websites were driven by this understanding and the impact website aesthetics, information organization, and user friendliness of websites can have on business and sales.

Moreover, this is a larger indication of the North Korean elite's comprehension of free market principles. Emphasis on North Korea's highly skilled, low wage labor as its main selling point is based on the understanding of supply and demand principles as well as the international trend of rising labor costs. That such understanding can be gleaned from North Korea's cyber activities indicates that the decision makers in the country are changing their strategies when dealing with the outside world. Though it is an informal assessment, this may suggest that the efforts invested into various skills transfer programs and professional training courses offered by European organizations such as the Hanns Seidel Foundation,[77] NGOs in the U.S. that host Track II Exchanges, and the western business schools in Pyongyang and Rason[78] have not been completely futile. Whether these impacts on the elite are positive or negative according to western standards will only be possible to tell with more time, given the elite's vested interest in regime stability.

These changed and changing perspectives and understanding about the outside world among North Korean elites pose the question of what implications this will have for North Korea's foreign relations and policies with the western world. How does this change the rules of the game when dealing and negotiating with North Korea? Additionally, this know how not only affects foreign relations on an official macro level; it is bound to have effects at the micro level, on individuals. How will increased Internet capacities and marketing skills impact an average person regarding North Korea, communism, capitalism and western powers? Will revamped propaganda skills be another weapon in the fight for international revolution? While it is unlikely that many Westerners will be swayed by North Korea's newly packaged propaganda, there may still be a small population won over. Fear of this actualizing in South Korea, perhaps not an unfounded fear with its contingent of leftist North Korean sympathizers, is the very reason its government claims the National Security Law must be upheld. South Korean citizens have been prohibited from directly accessing or possessing North Korean materials throughout different.

One major concern the international community should have regarding North Korea's official Internet capacities is its increased potential to engage in more illicit activities. North Korea is already well known for its various illicit activities, often through the

activities of "Office 39," which is responsible for gathering slush funds for the Kim Jong-Il. Some of their activities include illegal arms sales, printing counterfeit currency, and drug trafficking.[79] Recent findings show North Korea has ventured into operating gambling websites, mainly targeting South Korean clientele.[80] South Korean government authorities have blocked these North Korean gambling websites, which have garnered a considerable clientele. The first gambling website, dprklotto.com, was the product of a South Korean IT professional, and financial transactions were made possible through a Malaysian credit card clearance system.[81] These activities will evolve with time, but how is a question those watching North Korea need to ask and watch out for.

Cyber terrorism is another illicit activity that North Korea has begun to pursue vigorously. The danger of North Korean cyber warfare became a reality in 2009, when North Korean hackers launched multiple waves of "DDoS (distributed denial of service)" attacks which paralyzed major South Korean websites,[82] and breached South Korean security in multiple government institutions to access top-secret information, including a ROK-US joint war plan known as OPLAN 5027.[83] Recently, concerns about North Korea's cyber terror potential resurfaced when North Korea was declared responsible for the cyber attack on South Korea's National Agricultural Cooperative Federation, Nonghyup (NH). NH suffered serious financial losses as critical files were deleted, and its banking operations were halted for 18 days.[84] North Korea's elite group of hackers, trained since 1986,[85] is known to be highly skilled and is claimed to "rival the CIA."[86] Based in No. 110 Research Center under the North Korean Army General Staff's Reconnaissance Bureau as well as within the Ministry of State Security, recent estimates project about 1,000 to 1,200 hackers in the two brigades who have been trained at North Korea's most elite universities, such as Pyongyang Automation University, formerly Mirim University.[87]

Experts anticipate continued cyber attacks in the future and express concern at the possibility of attacks on South Korea's nuclear power plants, high-speed rail, air traffic, stock market, and other key infrastructure.[88] Early last year, the South Korean government established a Cyber Command unit within the military in response to the attacks.[89] Concerns about this powerful virtual army have been exacerbated by the potential for collaboration from sympathetic South Koreans, as suspected in the past.[90] These provocative activities may decrease the South Korean public's tolerance for the North, increasing opposition against South-North joint IT projects and outsourcing, like software made for telecom giant Samsung.[91] It is also indicative of an even broader two-pronged approach to cyberspace of both selling itself and defending itself – a combination of the charm offensive and military defensive. With such intent and capability, outsiders are faced with the dilemma of the impact open source information has on North Korea's increasing asymmetrical defense tactics.

North Korea's increasing virtual defense capability has paralleled its ability for information security and control. It is clear that Internet access in any form has been permitted only because control mechanisms have guaranteed security. As Chen, Ko, and Lee note, the regime's "top priority remains to shield itself from the potentially destabilizing political and social impact of the Internet."[92] Kim Heung-kwang, former professor of Computer Science in North Korea and current defector, has argued that the regime has implemented a "Mosquito Net" system that attempts to "attract the

inflow of foreign investment while simultaneously blocking infiltrations of foreign ideas, news, and culture."[93] Research conducted by leading North Korean IT institutions on security measures resulted in the methods seen in Table 4; South Korean database NK Tech shows 12 virus and security programs developed by North Korean firms. Moreover, outsiders can expect North Korea's stringent social hierarchy to be a natural control mechanism where the "core" class in Pyongyang will filter information for the masses. For example, Chosun Exchange recently introduced MIT's OpenCourseWare in the country, but high-level administrators filtered information by selecting material to be disseminated through the intranet.[94] A North Korean defector who studied computer science at Kim Chaek University further confirmed this strategy.[95]

**Table 4: Various Security Measures Proposed by North Korea's Main IT Institutions[96]**

| Institution | Strategy | Content | Strength |
|---|---|---|---|
| CIAST | One-Point Connection | Internet service only through a centralized proxy server | Prevention of problems associated with access to Internet |
| KCC | Single Gateway | Direct access to Internet permitted but all data monitored and controlled by Center | Will satisfy users' desire for diverse range of information |
| 6.26 Technology Center | Control through hardware and software | Computer installation of hardware and a web browser that will effectively restrict access | Increase individuality of Internet and maximize efficiency |

Source: Kim, Heung-Kwang, 2007

## Conclusion

North Korea's endeavors into the cyber realm began over two decades ago, propelled by economic and political goals of modernity and prosperity, but based on the premise of information control and regime stability. Its encounter with the Internet reveals a cautious and well-prepared, rational actor. North Korea quietly prepared official Internet connection for more than a decade, carefully constructing "our style" of domestic and external information exchange. It has tried its best within its constraints to become competitive in the international market by first, utilizing free open source information and shareware as a recourse for its knowledge transfer void; second, setting up multiple layers of security control mechanisms to ensure social stability; third, understanding basic economic principles and their application to different consumer bases for increased efficiency in marketing and sales; and fourth, maintaining a multi-pronged approach for increased state benefit. Given the cautiousness of the country and its set control mechanisms, observers should be careful about overemphasizing the significance of the Internet in reference to implications for increased democracy. Unsurprisingly, there have been no indications that North Korea intends to open up the Internet to its citizens.[96] Furthermore, if North Korea's Internet ventures are any indication, a case can be made for more vigilance in observing the unfolding succession and the regime's stability.

North Korea has embarked on a new frontier highly motivated by profits and justified by ideological revolution and military security. While exciting trends have emerged, as with many things related to the DPRK, more time is needed for stronger implications to emerge. As North Korea enters "Strong and Prosperous Nation" status and proceeds to build itself up until 2022,[97] it will be exciting to see how it continues to adapt its Internet strategy, develop the Internet-intranet nexus, and evolve its marketing skills for profit and revolution. In the meantime, one thing is clear: North Korea has fully logged in online for both profits and revolution in the 21st century.

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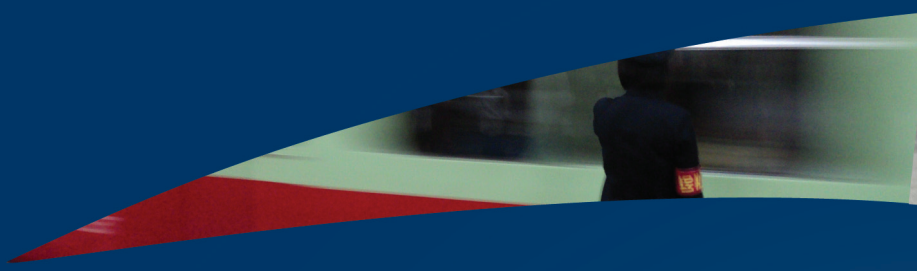

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