DPRK’s Digital Potential

North Korea is considered to be one of the poorest countries and many believe that it is behind the rest of the world in the IT sphere. But is this true?

Mobile phone and computer penetration

As of November 2019, there were 6 million mobile phones (on average costing $100-200) in use in the DPRK. But they cannot be used to make international calls. There are two telecommunication providers: Koryolink and Kangsong Net. In July 2019, the Washington Post, citing documents it obtained from a former Huawei employee, reported that the Chinese company helped build and test North Korea’s commercial wireless network in 2008.

In order to make a phone call to an international number, one has to obtain the necessary permission from a relevant authority. Despite this, the number of international calls made from the DPRK has increased slightly.

Every fifth household has a personal computer. According to data published by Recorded Future, a cybersecurity company, “the network activity of the North Korean regime increased by 300 percent since 2017”.

In addition, “from 2017 to the present, the highest levels of internet usage among the North Korean elite who can access the internet shifted from weekend evenings to conventional work hours on weekdays”.

Locally made gadgets?

On 26 September 2019, a smartphone made in the DPRK, Phurun Hanul (“Blue Sky”), was presented at the 15th Pyongyang Autumn International Trade Fair. Its modern features include facial and electronic fingerprint recognition, and touchless gesture controls.

The device costs $290 (a substantial amount of money even for the relatively well-off inhabitants of Pyongyang) and can only be sold to DPRK residents. To ensure this, strict requirements are adhered to at the time a phone is sold. A vendor records the passport details of a customer and the device is then considered to be their property.

A detailed review of the Taeyang W713 (“Ocean”) tablet, released in 2017, can be found on the NKNews website. It is made by Chunggu Haeyang Unha Technology Exchange Company, which is under DPRK’s Central Information Agency for Science and Technology (CIAST, also referred to as the central bureau for science and technology development). The company has also designed the Mirae (“Future”) WiFi Network and the Taeyang 8321 tablet PC, which can connect to this network using a SIM card.

DPRK media outlets have also written about Jindallae smartphones. They have fingerprint, image and voice recognition features, and several hundreds of thousands of them are made per year.

There is an ongoing discussion among experts about the origins of these devices. Some believe that North Koreans are manufacturing all these gadgets themselves; others think that they simply assemble Chinese parts, and yet another group is convinced that these products originate in the PRC and are then made under DPRK brands. The third viewpoint finds indirect support in the fact that Pyongyang 2425 is identical to China’s Xiaolajiao E-Sports and Allview Soul X5 Pro smartphones.

Own software
Even if it is hard to determine where these gadgets originated from, the same cannot be said about the associated software.

Some data is already available about DPRK’s efforts to digitize systems for managing and distributing available information on science and technology. According to North Korea’s propaganda outlet Meari, CIAST has “recently developed and rolled out the ‘Field Worker’s Companion (1.0)’,“ described as a project management app for mobile phone users.

In addition, CIAST uploaded hundreds of millions of articles on science and technology translated from various languages to North Korea’s Intranet. In April 2018, the Pyongyang Times reported that CIAST provided manufacturing plants with tens of millions of papers on technology, and developed and rolled out an approach for creating databases and search engines.

In June 2018, Rodong Sinmun (the official newspaper of the Central Committee of the Workers’ Party of Korea) wrote that CIAST launched software that would allow North Koreans to view indexes listing economic, science and technology resources from all over the world dating back to the end of 1970s, and to search and read foreign academic journals.

In February 2020, KB Financial Group Research Institute reported that, since 2018, North Koreans have been using a mobile payment app named “Woolim”, “an imitation of China’s WeChat Pay and Alipay”. “Users can buy products on North Korea’s e-commerce platforms using the app” and transfer money to each other.

In March 2020, Meari wrote about Taean 2.0, an integrated information management system that was implemented in a number of institutions and manufacturing facilities across the nation.

The updated version is a standardized corporate system for planning and managing the use of all the human, physical and information resources in an integrated manner. It can be used to process tasks ranging from production planning to managing products, manufacturing processes, workforce, key assets, electricity needs and financial reporting in real time.

The expertise of North Korean software developers is ascertained based not so much on stories about hackers, but on the fact that a team of three people from Kim Chaek University of Technology came in 8th place during the International Collegiate Programming Contest (ICPC), held in April 2019 in Portugal.

In September 2019, an article in Rodong Sinmun on advances in DPRK’s education system talked about new courses being offered on “information security, robotics, and engineering”. It also said that eleven “senior secondary schools with specialized IT courses” were to be established in each of North Korea’s provinces.

Radio Free Asia (RFA) reported that the DPRK hosted its 1st Pyongyang Blockchain and Cryptocurrency Conference in April 2019. Approximately 100 experts from this “cutting-edge field from around the world” participated in the event. Attendees included Virgil Griffith, an American programmer who has worked on the Ethereum cryptocurrency platform. On 29 November 2019, he was arrested for providing highly technical information that “could be used to help North Korea launder money and evade sanctions” in his presentation at the Pyongyang conference.

Cryptocurrency use by the DPRK is a politicized topic. In fact, Recorded Future has often reported that the increased internet usage in North Korea has been linked to mining of cryptocurrencies, their theft or other financial crimes. However, we will focus on hackers from the DPRK (or more specifically on the activities they supposedly engage in) another time.

Internet Censorship

While Kim Jong-il tried to prevent the flow of information, Kim Jong-un encourages it by adopting a “Mosquito-Net” model (which allows air to enter but not mosquitoes) in controlling the Internet. It is not difficult to find ideologically non-threatening information of common interest or about science and technology on North Korea’s Intranet. But to access it, users have to “fill out a lengthy application form” (in fact each subscription needs to be registered). More interestingly, North Korea’s version of Linux (Red Star OS or “Pulgŭnbyŏl”), which needs to be installed on every device, has at least two important characteristics.

Firstly, screenshots of everything that one views are automatically saved and cannot be deleted. Hence, when a device undergoes a routine inspection, a staff member of an appropriate agency can see straight away what website
a user has visited.

Secondly, the system checks the cryptographic signature of a file, which cannot be opened unless it is “authenticated” first. Only files generated on a user’s device or those sanctioned by the government can be viewed. Hence, it is problematic to save a file on a USB drive and then open it on a friend’s device so that he or she can access it. Of course, there are ways to bypass such restrictions, but they are not commonly available.

Radios in the DPRK are “fix-tuned to government frequencies” and it is also illegal to listen to foreign “enemy” stations. North Korea is also focusing on replacing traditional TV broadcasts with IPTV (a streaming service). It means that it will be impossible to tune into TV broadcasts from China, for instance, using homemade antennas. In fact, North Koreans can use these antennas not only to view Chinese broadcasts but also Korean ones, which include South Korean TV programs meant for residents of the Korean Autonomous Prefecture.

Still we need to remember Article 184 of the criminal code concerning the possession and dissemination of corrupt and decadent materials. Media content produced in the West and South Korea is deemed illegal and accessing it is punishable by law (imprisonment for up to 1 year, and up to 5 years for reoffending). Such rules may seem Draconian to proponents of freedom but, in accordance with South Korea’s National Security Act, “behaviors or speeches in favor of the North Korean regime” are also punishable by law.

All in all, North Korea’s hi tech sector (of the Fourth Industrial Revolution) is doing fairly well, which is in line with Kim Jong-un’s key economic policies.

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