

## **\*\*WSIS Stocktaking Special Report**

# **The Republic of Korea's ICT Journey**

## **2015-2023 Timeline**

### **Achievements of 2015-2016**

#### <Roadmaps & Strategies>

##### **'K-ICT' Strategy**

With the advent of an economic crisis, the need to improve the ICT industry and gather the opinions on the future direction of ICT promotion was raised. With the vision of achieving 'A Creative Korea Led by ICT,' the government actively promoted the development of next-generation foundational technologies such as innovative semiconductors, convergence displays, and visionary smartphones.

##### **\*Key Objectives**

- Achieving an 8% growth rate in the ICT industry
- Industrialization of intelligent SW R&D achievements such as Exobrain (language intelligence) and DeepView (visual intelligence) by 2018
- Completion of development of intelligent cyber terrorism response technology by 2019
- Establishment of intelligent medical information systems by 2021

#### **● Key Figures of 2015-2016**

##### **\*\*K-ICT Strategy**

- Export performance totaling \$96 million and export contract performance at the level of \$88 million

- 1st place in ICT Development Index in 2015
- 3rd place in global ICT export volume in 2015
- 13.5% increase compared to the previous year in SW exports
- Establishment of 'K-ICT Strategy 2016' as a new growth engine for ICT through the coordination plan of 'K-ICT Strategy'.

## ● **K-Global Project (2015)**

The Ministry of Science, ICT, and Future Planning announced on April 1, 2015, that it established the 'K-Global Project', which integrates and coordinates startup and venture policies in the ICT field. The K-Global Project serves as the first follow-up measure of the K-ICT Strategy, aiming to integrate and coordinate policies for startup and venture support in the ICT field. While previous ICT startup and venture support programs have shown visible results such as attracting investments worth 63.3 billion won, securing 280 business contracts, and establishing 152 corporations, there has been a recognized need for consolidating policy capabilities through integration and coordination, leading to the implementation of this project. The K-Global Project is pursued through three main strategies: "Integrated Operation," "Private Sector and Market Focus," and "Selection and Concentration." Its goal is to foster promising ICT companies with global market potential. The project has been consistently showing results up to 2024.

## ● **K-Shield Cyber Security Training Program (2015)**

The 'K-Shield Cyber Security Training Program' is designed to enhance the analysis and practical response capabilities of current information security professionals against cyber-attacks. It consists of a first phase of theoretical and practical training followed by a second phase of cyber practical training based on virtual scenarios.

In 2017, the Korea Internet & Security Agency (KISA) established a course on 'Digital Forensics,' reflecting the National Competency Standards (NCS) in the field of information security and industry demand. In 2018, KISA expanded its offerings by introducing courses on 'Penetration Testing,' 'Malware Analysis,' and 'Security Consulting' in addition to the existing 'Incident Response' course, totaling five courses. Graduates of these training

programs are active as information security experts in various fields including security-specialized companies and IT firms.



◀ K-Shield Logo [source=KISA]

## Achievements of 2017

### <Roadmaps & Strategies>

#### **'I-KOREA 4.0' Strategy**

In 2017, the government initiated the preparation of its grand strategy for participating in the Fourth Industrial Revolution, called the I-Korea 4.0. The aim of this strategy was to expand investment in research and innovation to encompass artificial intelligence, big data, robotics, brain science, industrial mathematics, nanotechnology, and material science.

#### **\*Key Objectives**

- Promotion of the world's first commercialization of 5th generation mobile communication (5G)
- Regulatory easing to enable various businesses to create innovative services utilizing the Internet of Things (IoT)
- Focus on advancing blockchain technology
- Establishment of a data utilization ecosystem through legislation such as anonymization measures to protect personal information while safely

utilizing it.

- Government-wide R&D system innovation

## **Roadmap for Hyper-Connected Intelligent Networks**

### **(초연결 지능형 네트워크 구축 전략)**

In December 2017, the Ministry of Science and ICT established a roadmap for supporting the world's first commercialization of 5G, including conducting spectrum auctions, abolishing IoT entry regulations, and building a dense IoT environment to prepare for the Fourth Industrial Revolution through the strategy of building hyper-connected intelligent networks. Amid intensifying global competition in the 5G mobile communications market, Korea has presented strategies and roadmaps to maintain the world's highest level of network competitiveness even in the era of the Fourth Industrial Revolution.

#### **\*Key Objectives**

- First commercialization of 5G globally, nationwide network deployment by 2022.
- Expansion of IoT connected devices to 30 million by 2021.
- Achieving smart and secure networks based on software and artificial intelligence.
- Institutional guarantee of universal access to high-speed internet in all areas including rural and mountainous regions.

## ● **Key Figures of 2017**

### **\*\*General**

- 58.6% increase compared to the previous year in the number of commercialization cases in ICT R&D projects reaching 790 cases, with sales generated through commercialization reaching 317.68 billion won
- 56.1% increase compared to the previous year in the efficiency of investment in commercialization, reaching 0.89, the highest level in the past five years

- ICT intellectual property exports increased from \$4.57 billion in 2011 to \$9.72 billion in 2017, with an average annual growth rate of 13.4%

## ● **'Data-IT-Girls' & 'Co-Du-Ace' Education Program**

The 'Data-IT-Girls' program is a no-cost educational initiative aimed at nurturing female talent in the field of data and IT. It concentrates on enhancing the skills of women professionals in data analysis through comprehensive training in data competency. Participants can augment their proficiency in their respective fields and roles, thereby bolstering their competitiveness in the job market and facilitating their employment or transition to new positions.

Similarly, the 'Co-Du-Ace' program is tailored to equip professionals with expertise in AISW convergence project design and educational content planning. It emphasizes the development of problem-solving abilities and aims to cultivate intermediate to advanced-level SW education specialists capable of facilitating project-based learning.

Both programs, organized by the Ministry of Science and ICT and hosted by the Korea National Information Society Agency (NIA), aim to enhance the capabilities and awareness of women in the software industry, provided entirely free of charge.

## **Achievements of 2018**

### ● **Key Figures of 2018**

#### **\*\*General**

- 12.8% increase compared to the previous year in sales of commercialization cases in ICT R&D projects reaching 358.34 billion won
- ICT intellectual property rights, which had been in deficit since 2014 with -\$2.77 billion, continued to improve steadily, turning into a surplus of \$440 million in 2018.

#### **\*\*K-Global Project**

- The number of employees in K-global 300 companies was 4,571, a 10% increase from the previous year
- Sales in the first half of 2018 amounted to 167.7 billion won, showing a 4.3% increase compared to 160.8 billion won in the first half of 2017
- Successful fundraising amounted to 87.3 billion won in the first half of 2018, representing a 51% increase compared to the previous year
- The number of patent applications in the first half of 2018 was 1,198, a 48% increase compared to the previous year

## ● **World's First 5G Trial Service at the PyeongChang Winter Olympics**

The 2018 PyeongChang Winter Olympics was called the 'ICT Olympics,' featuring groundbreaking technologies like the world's first 5th generation mobile communication (5G) trial service, ultra-high-definition (UHD) broadcasting, artificial intelligence (AI), and Internet of Things (IoT) services. This event showcased innovative advancements such as Type Slices, allowing viewers to see screens from multiple angles, and Sync View, offering game footage from athletes' perspectives. The Ministry of Science and ICT, along with KT, Intel, and Samsung Electronics, prepared for the 5G trial service using the 'PyeongChang 5G Technology Specification (SIG),' developed through collaboration with global companies, underscoring the event's pioneering role in integrating cutting-edge technology into the Olympic experience.

For the service, installed 5G data processing equipment (BBU) can handle up to 20Gbps, radio frequency processing equipment (RFU) can handle up to 10Gbps, and terminals can achieve up to 5Gbps. In terms of terminals, it is currently 10-50 times faster than Long Term Evolution (LTE). However, the significance of this trial service lies not just in speed enhancement but in showcasing 5G usage services in advance.



▲ Promotional event for the PyeongChang Winter Olympics [source=BusinessKorea]



▲ 5G Showcasing at the PyeongChang Winter Olympics [source=ITU]

## ● Establishment of AI-HUB

The AI-HUB, a comprehensive artificial intelligence platform operated jointly by the Ministry of Science and ICT and the National Information Society Agency, serves as a crucial infrastructure for individuals and entities engaged in the development of AI technology, products, and services. It grants access to 14 categories of AI training data, established through the Intelligent Information Industry Infrastructure Project, and showcases exemplary instances of data utilization.

This initiative represents a pioneering effort in constructing AI training data, setting a global precedent. Starting with the inception of 22 data types in 2019, the collection has grown substantially, reaching a total of 691 data types available on AI-HUB as of 2023. The participation of organizations in this data construction project has surged significantly, increasing from 46 organizations in 2017 to 632 in 2022, with over half of these being

small and medium-sized enterprises. Many of these organizations have transitioned into AI-focused companies because of their involvement in this project.



◀ AI-Hub Logo [source=AI-Hub website]

<https://aihub.or.kr>

## Achievements of 2019

<Roadmaps & Strategies>

### **'5G+' Strategy for Achieving Innovative Growth**

The government shared the national vision for achieving innovative growth in the 5G era. The government announced the '5G+ strategy' to create new industries and services based on 5G, aiming not just for the world's first but to establish the world's best 5G ecosystem. This strategy was designed to propel Korea into a leading position in the global 5G ecosystem, fostering innovation, economic growth, and job creation by leveraging the capabilities of 5G technology across various sectors.

\*Key Objectives

- Securing initial markets and improving citizens' lives in smart factories, autonomous vehicles, smart cities, digital healthcare
- Expansion of private investment by establishing testbeds and industrial enhancement
- Activation of 5G services and stable user protection.
- Expansion of overseas support by globalizing South Korean 5G technology and services

### ● Key Figures of 2019

\*\*General



- Establishment of foundations for activating the data economy, with a 29% growth in the big data market compared to 2017
- 59% increase in the number of AI specialist companies compared to 2016, and a 107% expansion in AI R&D investment compared to 2016
- 15.7% increase in the establishment of new ICT corporations and a 78% increase in new investments in the ICT sector by venture capital compared to 2016
- Reduction of annual household communication expenses by over 1.8 trillion won

#### **\*\*K-Global Project**

- The total number of employees in beneficiary companies was 5,612, showing a significant increase of 1,625 individuals, a 40.8% increase compared to the previous year
- The total sales of beneficiary companies amounted to 452.3 billion won, marking an increase of 1,210 billion won, a 36.5% increase compared to the previous year
- The number of patents filed by beneficiary companies was 1,364, showing an increase of 22.2% compared to the previous year

### ● **World's First Commercialization of 5G Service**

April 3rd, 2019, the commercialization of 5th generation communication technology, 5G, which is up to 20 times faster than 4G, started in South Korea for the first time in the world. The three mobile telecommunication companies, which initially planned to launch the service on the 5th, declared 'World's First 5G' by releasing the first 5G subscribers. 5G services were initially launched in densely populated areas in Seoul, metropolitan areas, and some major cities. By expanded the construction of 5G networks continuously, by the end of 2019, 5G services in population-dense areas were available in 85 cities nationwide.



▲ Launch ceremony for SK Telecom's 5G service [source=NikkeiAsia]

### ● **Launch of Public Wi-Fi Service on Buses (공공와이파이)**

The Ministry of Science and ICT announced that starting from July 5, 2019, public Wi-Fi will be installed on 23,047 urban buses nationwide by December, 2019. Since 2018, the ministry had been working with local governments and the Korea Information Society Development Institute to install public Wi-Fi on urban buses across the country, aiming to reduce household communication expenses and improve communication accessibility. The first phase of the project provided public Wi-Fi services on 4,200 buses starting from May, 2019. From June onwards, the second phase extended public Wi-Fi installation to all 23,047 buses, and the project was completed in 2019, covering 86% of urban buses nationwide.

### ● **Reaching 10 Million Gigabit Internet Subscribers**

Since the introduction of high-speed internet in 1998, a new era of gigabit internet emerged in 2014, boosting speeds that are 10 times faster. Over the years, mobile communications rapidly progressed towards the 5th generation, which is 1,000 times faster than 4G LTE. This shift marks a transition from megabits per second (Mbps) to gigabits per second (Gbps) in both wired and wireless communications. KT's nationwide gigabit internet, was fully launched in October 2014, and reaching 10 million households of subscribers in 2019, reflecting the rapid adoption and demand for ultra-fast internet services in Korea.

# Achievements of 2020

<Roadmaps & Strategies>

## **The Korean New Deal Project**

### **\*Digital New Deal, Green New Deal, Strengthening Safety Nets**

The Korean government tackled the challenges of economic recession recovery and COVID-19 structural changes by implementing the Korean New Deal project. Comprising the Digital New Deal and Green New Deal, this initiative aimed to establish regulatory frameworks and institutional foundations to encourage significant private investment and innovation, facilitating the transition to a digital and green economy. A total investment of 160 trillion won will be concentrated on 38 projects by 2025, creating 1.9 million jobs and driving the development of new markets and private sector demand.

### **Digital Inclusion Promotion Plan (디지털 포용 추진계획)**

With the acceleration of digitalization in the economy and society due to the spread of COVID-19, there were concerns that digital disparities will deepen economic and social inequalities and discrimination. Therefore, policies for all citizens to participate in the digital world without discrimination or exclusion and to enjoy the benefits of digital technology equally were needed. The Digital Inclusion Promotion Plan aims to prevent inequalities that may occur with the digital transition and improve the quality of life of vulnerable groups with digital technology.

#### **\*Key Objectives**

- Strengthening digital capabilities of all citizens

- Creation of an inclusive digital usage environment
- Promotion of inclusive utilization of digital technology
- Establishment of the foundation for digital inclusion

## ● Key Figures of 2020

### \*\* ICT Regulatory Sandbox

- Designated companies that launched new products and services through the ICT Regulatory Sandbox saw a 179.3% increase in product sales compared to 2019, reaching 158.9 billion won
- In response to the designation under the ICT Regulatory Sandbox, 388 new employees were hired for new business initiatives representing growth of 273.1%

### \*\* Digital New Deal; Data Dam Projects

- Accumulated and opened 1,458 types of data through 10 platforms, with users' utilization reaching 57,793 cases, 19.6 times higher compared with 2019
- Participation of non-ICT companies increased from 33.1% in 2019 to 64.8% in 2020
- At the AI Hub, artificial intelligence learning data utilized by over 12,000 individuals, accumulating more than 48,000 uses as of November 2020

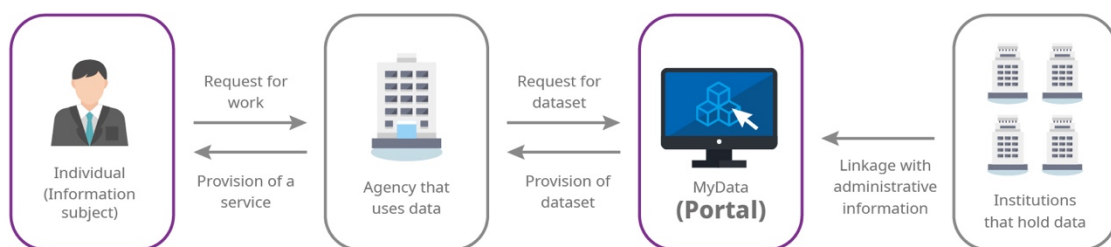
## ● Exceeding 10 Million 5G Mobile Telecommunication Subscribers

The 5G mobile communication service began in June 2019, and it surpassed 10 million subscribers after 1 year and 6 months of commercialization. According to the Wireless Communication Service Statistics released by the Ministry of Science and ICT on December 2, 2020, the number of 5G subscribers at the end of October was counted as 9,983,978. This figure represents an increase of 735,113 subscribers compared to the previous month, marking the second-largest monthly increase after a growth of approximately 800,000 subscribers by the end of August in 2020.

## ● Establishment of Public MyData Service (마이데이터)

The Republic of Korea has successfully built and operated a strong digital government, offering a diverse range of online services to the public. However, despite these advancements, citizens still found themselves navigating multiple websites or physically visiting institutions to obtain necessary documents. Also, the practice of providing unnecessary personal information raised concerns about the potential for personal information leakage or misuse. To solve these problems the Public MyData service was launched, allowing citizens, and data subjects, to access their administrative information directly and selectively provide only the essential information to the organizations of choice.

The official definition of MyData is a series of processes in which individuals, as information subjects, actively manage and control their own information and proactively utilize it in their personal lives, ranging from credit management to asset management and even to health management.’ The goal of the MyData service is to professionally support individuals in efficiently managing and utilizing their personal information. MyData plays a role in allowing individuals, as owners of information, to handle their own data. It enables one company to obtain permission to share personal data held by another company or individual. In simpler terms, it involves obtaining permission from the individual whose information is sought and then acquiring that information from another company or individual.



[How to link and expand MyData in the public sector]

▲ Outline of MyData service [source=dgovkorea website]

● **Opening of Digital Competency Centers (디지털 배움터)**

The Digital Competency Center initiative offers complimentary digital education services at various public venues like government offices, libraries, and welfare centers. With over 1,000 centers spread across 18 cities and provinces in Korea, the program aims to provide accessible training opportunities to the public. Additionally, recognizing the

challenges faced by certain demographics, such as the elderly and those residing in remote areas, a mobile 'EduBus' equipped with digital training facilities is deployed to cater to their needs.

Launched in July 2020, the Digital Competency Center has trained over 2.5 million individuals in digital skills by 2023. Notably, more than half of the participants in 2022 were seniors aged 60 and above. A survey conducted on the trainees revealed a significant improvement in their digital competency levels following the training sessions.



▲ A senior learning Kiosk [source=ITBiz News]

## Achievements of 2021

### ● Key Figures of 2021

#### **\*\*ICT Regulatory Sandbox**

- Regulatory sandbox initiatives attracted investments exceeding 14 trillion won, creating over 2,800 jobs
- Total sales in the ICT and industrial sector reached 518 billion won

#### **\*\*Digital New Deal**

- Private and public institutions accumulated 3,246 types of data, with users' utilization reaching 83,336 cases, an increase of 28.3 times compared to the previous year

- Participation in digital transformation by non-ICT companies increased by 85%
- 49,157 digital jobs created, including 40,105 individuals directly involved in related projects

#### **\*\*K-Global Project**

- New job creations increasing by 45.4% compared to the previous year, totaling 2,547 jobs
- Total sales surged to 679.2 billion won, a increase of 37% compared to the previous year
- Investment attraction amounted to 799.7 billion won, a growth of 199.2% compared to the previous year
- The number of patents increased by 18.7% compared to the previous year, reaching 1,620 patents

### **● World's First Opening of LTE-Based Public Safety Communication Network (PS-LTE)**

With the completion and opening of the PS-LTE (Public Safety LTE) network, various government agencies including police, fire departments, coast guard, military, and local governments were able to enhance their disaster response capabilities by communicating through a unified network during disaster situations. Starting from June 2002, Korea has successfully completed the construction of the PS-LTE-based disaster safety communication network in March 2021. This achievement marked the world's first nationwide disaster safety communication network based on PS-LTE, integrating voice and data to facilitate more accurate information gathering and communication during disaster situations.



▲ Opening ceremony of the PS-LTE network [source=Sijung News]

## ● Establishment of the National Secretary Service (국민비서)

The term 'National Secretary' refers to an 'online personal assistant' service that provides citizens with administrative information in advance and offers consultations for their inquiries. Currently, citizens can receive various information, including traffic violation penalties, driver's license renewal, national scholarship applications, and general health check-up dates. Citizens can choose one convenient method among popular private apps such as Naver, KakaoTalk, and Toss to receive various information and even make payments if necessary. One of the greatest advantages is that people of all ages and genders can acquire and process essential information without discrimination, given the diverse range of provided information.

The National Secretary is a groundbreaking 'next-generation notification service' that is rare to find worldwide. Although governments in other countries may mandate information provision to citizens during national disasters, cases like the National Secretary, where the government proactively provides tailored administrative information to citizens, are extremely rare. Moreover, the National Secretary provides not only simple notification services but also counseling services utilizing AI chatbots. The 'Guppi(구삐) Chatbot', a 24-hour chat counseling service using smartphones or PCs, has been under trial operation since May 2021.





◀ 'Guppi(구삐)' Logo [source=National Secretary website]

## ● **Administrative and Public Institution Information System Cloud Conversion Support**

Beginning in 2021, the Ministry of the Interior and Safety, along with the National Information Society Agency, initiated a project to migrate administrative and public institution information systems to the cloud. This initiative aims to establish a cloud-based platform for public service delivery, allowing these institutions to swiftly adapt to evolving digital demands and offer services in a timely and reliable manner. The goal is to transform these systems into user-friendly and convenient formats like popular portals like Naver by the year 2030.

Managed by cloud service providers (CSPs), the project involves the deployment of public cloud infrastructure in the form of Infrastructure as a Service (IaaS). This transition signifies a shift towards cloud-native solutions, migrating 25 information systems from four government and public institutions.

## **Achievements of 2022**

### ● **Key Figures of 2022**

#### **\*\*General**

- Highest-ever technology exports were achieved, totaling 15.22 billion dollars, representing a 2.0% increase compared to the previous year
- Technology imports also increased by 5.0%, reaching 19.63 billion dollars.

#### **\*\*ICT Regulatory Sandbox**

- ICT Regulatory Sandbox contributed to job creation by hiring an additional 1,549 employees for new business ventures
- Approved companies achieved sales of 68.8 billion won through the introduction of new products and increased service users

## ● **Launch of Dedicated Quantum Cryptography Communication Line Service**

In July 2022, KT and SKT (SKB) launched a dedicated quantum cryptography communication line service that utilizes the principles of quantum mechanics to physically prevent eavesdropping attempts. This service employs Quantum Key Distribution (QKD) technology to transmit encryption keys via quantum information, ensuring that any eavesdropping attempt destroys the key, thereby maximizing data security.

Currently, this service is being provided to public sectors such as central administrative agencies' national convergence networks, as well as businesses requiring high security like 5G backbone networks and the manufacturing industry, under B2B and B2G models. The dedicated quantum cryptography communication line service is based on international technical standards and has been validated across various forms of services in public, industrial, and medical sectors to ensure compatibility and scalability.

## ● **Establishment of a 5G Government Network**

In July 2022, the government launched the '5G Government Network' project, aimed at transitioning national agencies from wired-based to wireless environments using 5G technology. This project will enhance public officials' productivity by enabling smarter work environments and eliminating previous constraints imposed by reliance on wired services for administrative tasks. By focusing on implementing network slicing technology to secure a dedicated channel for government use within the 5G spectrum, the government aims to establish a nationwide 5G mobile communication network for government agencies by 2025.

## ● **Installation of Public Wi-Fi in 45,527 Locations**

Since its inception in 2012, public Wi-Fi has been expanding and available for public use. By 2022, it provided free data to citizens at a total of 72,000 locations, including 43,000 public places and 29,000 city buses. Public Wi-Fi is being actively utilized by 52% of the population, establishing itself as a major means of accessing data for the public.

As we entered the digital platform government era, where the government got closer to people through digital means, and as we shifted towards high-capacity content, the government planned to proactively expand and enhance the quality of public Wi-Fi to meet citizens' demands for higher-quality Wi-Fi services starting from 2022.

## ● **KOREN, AI-based Autonomous Network**

The Next-Generation Network Leading Research Testbed (KOREN) serves as a comprehensive research platform in Korea and internationally, integrating software-defined networking, cloud, and NFV into a unified infrastructure for experimentation by industry, academia, and research institutions at no cost. KOREN provides extensive, high-quality domestic and international research and development networks to facilitate testing and validation of future network technologies, fostering research and international collaboration. In 2022, the National Information Society Agency (NIA) invested 940 million won to verify autonomous network technologies, including software defined (SDx), security, and ultra-high capacity communication. By applying AI-based SDx autonomous network technology to all access points (nodes), thereby evolving KOREN into an advanced research network capable of demonstrating cutting-edge technologies for Beyond 5G (6G) mobile communication.

# Achievements of 2023

## ● **Key Figures of 2023**

### **\*\*ICT Regulatory Sandbox**

- A notable increase in new employment was observed, with 4,097 new hires compared to 1,549 in the previous year

- Sales reached 114.6 billion won compared to the previous year's 68.8 billion won
- Investments attracted amounted to 179.6 billion won, a substantial rise from the previous year's 107.6 billion won

**\*\*K-global Project**

- 8,238 employees, increasing up to 16% compared to the previous year
- Sales reached 8,109 billion won, showing a substantial increase of 1,571 billion won compared to the previous year's 6,538 billion won

● **Announcement of the AI Digital Bill of Rights**

The Ministry of Science and ICT has unveiled the full contents of the 'Digital Bill of Rights,' which embodies principles of freedom, rights, fairness, and safety in the digital environment. The Digital Bill of Rights presents a model for the international community to pursue a digital common prosperity society, seeking digital innovation while ensuring that everyone can enjoy its benefits justly and fairly. It outlines principles for realizing this vision.



◀ Announcement of the Digital

Bill of Rights [source=Yonhap News]