



Science, Technology & ICT Newsletter(NO.76)

Strategy to Secure

Innovative Digital Technologies

MSIT to establish a Strategy to Secure Innovative Digital Technologies in Efforts to Accelerate Digital Transformation

The Ministry of Science and ICT (MSIT, Minister : Lim Hyesook) held an expert meeting identify and foster innovative digital technologies on March 8 and announced that it will work to establish the Strategy to Secure Innovative Digital Technologies to Accelerate Digital Transformation (working title).

Digital transformation has enormous potential for the global economy to ① significantly improve industrial productivity, ② bring transformative changes to people's lives, and ③ present new opportunities and challenges.

In response, many countries are stepping up their efforts to secure innovative digital technologies as they believe it will be a make-or-break task for global technology

competition. Government investment plans are being announced one after another to get an upper hand in technologies such as artificial intelligence, 6G, and quantum.

(U.S.) The U.S. is investing USD 29 billion in R&D for ten high-tech technologies over the next five years (U.S. Innovation and Competition Act, June 2021)

(China) China is aiming for 10% of its gross domestic product to come from the digital economy by 2025, up from 7.8% in 2020, while focusing its research on seven technology areas (14th Five-Year Plan, March 2021)

(EU) The European Union is implementing the Horizon Europe programme to tackle global challenges and enhance industrial competitiveness

The MSIT announced a plan* to foster ten selected Critical and Emerging Technologies that includes many digital technologies such as artificial intelligence and next-generation communications technology in December 2021, in order to respond to the growing competition for technological supremacy and secure technological leadership.

* Strategy to Foster and Protect Critical and Emerging Technologies (Ministers' Meeting on Science and Technology, December 2021)

As a follow-up to the Strategy to Foster and Protect Critical and Emerging Technologies, the Ministry will implement a Strategy to Secure Innovative Digital Technologies in efforts to accelerate digital transformation and to get ahead in the global competition for digital technologies.

The strategy will include measures to foster ten innovative digital technologies.

The Strategy includes some of the ten Critical and Emerging Technologies, namely: digital technologies such as ① artificial intelligence, ② fifth and sixth generation networks (5G/6G), ③ quantum science, ④ cybersecurity, ⑤ intelligent semiconductor solutions, and technological areas that can be accelerated with digital technologies such as ⑥ space, ⑦ advanced robotics.

Beyond the ten Critical and Emerging Technologies, the Strategy also includes essential technologies that need to be developed to accelerate digital transformation such as ⑧ extended reality (XR) technology, ⑨ high-performance computing (HPC), ⑩ blockchain.

In formulating the Strategy, the MSIT determined that it is essential to ① secure technological dominance in areas that Korea has strengths in, and ② reduce technological gaps in core technologies and advance homegrown technologies in order to win the global technology competition and to strengthen supply chain resilience.

In this context, the Ministry will also review measures to innovate the digital R&D system, such as establishing a mission-oriented R&D system to facilitate R&D and

creating an immersive research environment by offering more follow-up research incentives.

At the expert meeting attended by representatives from the industry such as LG Electronics, NHN Corporation, KT Corporation, and experts from the academia the field of artificial intelligence and telecommunications, the MSIT will share the direction for securing innovative digital technologies to accelerate digital transformation, followed by a discussion session to collect opinions from experts.

Deputy Minister Park Yunkyu said, "Establishing an enabling environment for digital technologies is at the top of the government's agenda in order to accelerate digital transformation that will drive Korea's economic recovery and economic growth while improving the quality of lives of the next-generation of Koreans."

He added, "We will equip the country with unparalleled digital capabilities with the Strategy to Secure Innovative Digital Technologies."

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1. Going Global

1.1 The MSIT Successfully Secures a Record High of 10 Seats on the ITU Council in ITU World Telecommunication Standardization Assembly (WTSA-20)

The Ministry of Science and ICT (MSIT, Minister : Lim Hyesook) announced that it successfully secured 10 seats on the ITU Council, which is the highest-ever number of seats held by Koreans, during the International Telecommunication Union (ITU)'s the World Telecommunication Standardization Assembly* (WTSA-20**) that took place in Geneva, Switzerland, 1 to 9 March 2022, which reaffirmed Korea's international standing in the international standardization of ICT.

* The WTSA is the highest decision-making body of the ITU Telecommunication Standardization Sector (ITU-T) that elects chairmen of technical Study Groups (SGs) and discusses important matters involving standardization of information and communication technology such as establishing or amending resolutions and recommendations.

* World Telecommunication Standardization Assembly (WTSA)

In this WTSA, 149 candidates from 37 countries competed fiercely for taking up the next term of chairmanship of the International Telecommunication Union's Telecommunication Standardization Sector (ITU-T) Study Groups. This WTSA-20 was the first time for Korea to have such a large number of chairmen and vice-chairmen - two chairmen and eight vice-chairmen appointed - in the ITU, a representative agency in international telecommunication standardization.

As Korea has chairmen and vice-chairmen in ten out of twelve ITU-T Study Groups (including the Advisory Group), Korea now boasts the status of having the world's second largest number of appointments in chairmen and vice-chairmen.

In particular, as Korea has taken the chairmanship in the information security Study Group (SG17), and IoT and smart city Study Group (SG20), two Study Groups in charge of developing key technologies for digital transformation, it has laid foundation for taking the initiative in international standardization of ICT, amid global technology competition.

In addition, whether to adopt the new Resolution on enhancing the role of ITU-T for preventing the spread of pandemic, which is one of the draft Resolutions submitted by Korea, will be discussed in the 2022 ITU Plenipotentiary Conference (September 2022), and all the three amendments to the Resolutions (draft), including cyber security and gender equality were adopted.

On the occasion of the WTSA-20, Mr. Cho Kyeongsik, Second Vice Minister of the MSIT was engaged in election campaign activities for the Korean candidate to be

elected for ITU Deputy Secretary-General and for Korea to be elected for the ITU Council Membership for the ninth consecutive time.

In the elections of high-level positions at the 2022 ITU Plenipotentiary Conference scheduled to be held in September this year, Dr. Lee Chaesub of Korea, who is currently serving as Director of Telecommunication Standardization Bureau (TSB) has declared candidacy for Deputy Secretary-General, and Korea aims to get elected as a ITU Council Member for the ninth consecutive time.

Second Vice Minister Cho Kyeongsik requested strong support for Korea's candidacy for the post of Deputy Secretary-General and ITU Council Membership, by taking opportunity of official luncheons and bilateral meetings with Heads of Delegations from ITU Member States attending the WTSA-20.

Vice Minister Cho of the MSIT commented that "The fact that Korea secured seats for ten chairmen and vice-chairmen in the WTSA-20, by far the largest number ever, demonstrates that long-standing experiences and efforts made by Korean experts in international standardization organizations are bearing fruit."

Vice Minister Cho also said, "In the age of global technology competition amid digital transformation, taking the initiative in international standard development for ICT is getting more critical. Therefore, the MSIT will strengthen support for enhancing competitiveness for international standardization, such as nurturing experts in the field of international standardization, and promote standard development activities at home and abroad."

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2. Global Cooperation

2.1 'Beyond 5G' to begin the Age of the Great Digital Voyage

Minister Lim Hyesook of Science and ICT delivered her keynote speech on 'Beyond 5G and 6G : Into the Age of the Great Digital Voyage,' at the ministerial programme, 'What's next for the Mobile Sector,' of the Mobile World Congress on March 1.

During her keynote speech, Minister Lim introduced Korea's achievements earned since it unveiled its world's first commercial 5G in April, 2019, and the government's wide range of efforts to boost 5G deployment, from 28GHz backhaul metro Wi-Fi to the network sharing initiative in rural areas.

Minister Lim said in her speech that "In the 'Age of the Great Voyage', pioneering new continents was done by ships. However, in the future, we will take the Great Digital Voyage to the world of new digital continent, such as Metaverse, with innovative digital technologies including blockchain, artificial intelligence, and cloud computing which will all be based on future telecommunications networks." She also urged all countries to join forces and realize the value of digital inclusion, so that no one will be left behind or excluded.

During her visit to MWC, the Minister also paid a visit to pavilions of domestic companies and small and medium-sized companies, in a bid to take a closer look at future technologies such as metaverse, artificial intelligence, and the next-generation network.

High-level, bilateral dialogues continued with Commissioner Jessica Rosenworcel of Federal Communications Commission of the United States, Minister Timo Harakka of Transport and Communications of Finland, and Minister Johnny Gerard Plate of Communication and Information Technology of Indonesia. At the dialogues, Minister Lim shared developments in 5G deployment including its best practices, while cementing the bilateral partnership in 5G and 6G development.

On the following day, Minister Lim is going to sign the Memorandum of Understanding (MoU) on cooperation in metaverse strategy with Secretary-General Mats Granryd of Global System for Mobile Communications Associations (GSMA) after the bilateral discussion.

Minister Lim wrapped up her day saying that "global cooperation is a necessity to design the future of the digital transformation era, and to respond to changes brought by emerging technologies like 6G and metaverse. In this, Korea will lead global trends with its outstanding ICT technologies while exerting leadership in forming cross-border cooperation."

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2.2 MSIT to conclude MoU on Metaverse Cooperation with GSMA

The Ministry of Science and ICT (MSIT; Minister Lim Hyesook) announced that MSIT concluded the Memorandum of Understanding (MoU) on metaverse cooperation with Global System for Mobile Communications Association (GSMA) on March 2 at Mobile World Congress(MWC) 2022 held in Barcelona, Spain. The GSMA with more than 750 mobile carrier members from 220 nations is responsible for presenting the future strategy as well as leading key trends in the world communications industry.

Under the MoU on metaverse cooperation, Korea will share information related to Korea's metaverse ecosystem development while the GSMA will spread Korea's practices to the global mobile carriers and developers to seek business collaboration opportunities.

Minister Lim Hyesook of Science and ICT said that "if Korea's metaverse initiatives, including the pan-governmental strategy on metaverse released last January, and innovative business practices from the private sector can be shared with the world, this will hold significance because Korea may lead the metaverse industry, which is still in its infancy." She added that "I expect that this MoU provides an opportunity for the two parties to participate as a keynote speaker at each other's hosting conferences, and helps vitalize the global cooperation network to create new business opportunities."

Director-General Mats Granryd of the GSMA said that "Metaverse that connects the physical and virtual world is well aligned with the theme "Connectivity Unleashed" of MWC 2022. I hope that we can share concrete ideas on the cooperation with Korea at GSMA Mobile 360, scheduled to be held this August in Singapore."

MSIT and GSMA also have been working closely together by sharing Korea's leading practices from the public and private sectors after they signed the MoU on 5G cooperation at the MWC 2019.

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2.3 MSIT to hold the first Korea-Colombia ICT Policy Forum

The Ministry of Science and ICT (MSIT, Minister: Lim Hyesook) announced that it virtually held the first Korea-Colombia Information Communications Technology Policy Forum on March 18, with the Ministry of Information, Communication and Technology of the Republic of Colombia.

At this Forum, the Korean side introduced key achievements and ICT policies in the

areas of digital transformation, artificial intelligence, talent nurturing, cyber security and climate change, which will be particularly helpful to Colombia that is pursuing digital transition in the public and private domains as well as the 5G deployment across the nation. This event is expected to serve as a venue to cement the bilateral partnership in the ICT sector.

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3. ICT Trends of Affiliated organizations

3.1 Gwacheon National Science Museum to Sign an Online MOU on Development of Scientific Culture with the Maloka Science Museum in Colombia

Gwacheon National Science Museum (Director : Yi Jeongmo) signed an MOU on development of scientific culture with the Maloka Science Museum in Colombia (Director Maria Christina Diaz Velazquez) on Tuesday, March 15.

* The Maloka Science Museum is a private, non-profit organization based in Bogota, Colombia, and was established in 1998 to pursue expansion of science and technology, that contributes to sustainable development. In addition, the science museum exhibits a variety of themes ranging from climate change, emotion, human life, to history of science, and thus has become a central innovative learning space in Bogota.

Gwacheon National Science Museum will showcase exhibitions that enable an interesting experience of scientific principles at the 2022 Bogota International Book Fair (hereinafter the Book Fair), which will be hosted in Bogota, Colombia, from April 19 to May 2. Furthermore, eighteen types of content that ensures experiencing scientific principles, displayed in the Book Fair, will be donated to the Maloka Science Museum after the end of the Book Fair.

In the Book Fair, Korea will participate as a guest country, in celebration of the 60th anniversary of the establishment of diplomatic relations between Korea and Colombia. There will be a display of eighteen types* of content that ensures experiencing scientific principles, developed by Gwacheon National Science Museum, at the request of the Ministry of Culture, Sports and Tourism to participate as a guest country.

The exhibits will allow visitors to experience scientific principles, from the perspective of conflict and co-existence, in line with the themes of guest country pavilions.

To this end, Gwacheon National Science Museum will work together with the Maloka Science Museum, a representative science museum in Bogota, Colombia, in order to jointly operate exhibitions. After the Book Fair, eighteen types of exhibits will be donated to the Maloka Science Museum.

The two institutions signed an MOU to promote understanding of science and technology of citizens from both countries, and to spread comprehensive scientific culture, by taking this opportunity.

The main areas of cooperation are exchange of talent, exhibition items, exhibition videos and resources for research, and the two sides agreed to have talks in the future to seek ways to cooperate in diverse areas to promote social values.

Director Yi Jeongmo of the Gwacheon National Science Museum said, "Starting with the Book Fair, the Museum plans to seek more cooperation with foreign science

museums to promote international networks, which have stagnated since COVID-19. We became the first Korean science museum to make donations to foreign science museums, and I believe this will not only make our museum more internationally recognized but also contribute to the spread of science-related culture across the borders.”

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3.2 RRA Develops a High-speed Measurement System of 28GHz 5G Antennas

The Ministry of Science and ICT (MSIT, Minister : Lim Hyesook) announced that it has developed a high-speed measurement system of 28GHz 5G antennas for the first time in the world.

Small antenna test facilities* are used for 5G antenna measurement in general, but it takes about 200 hours to measure 5G devices, which delays the launch of new products onto the market.

* Large measurement facilities are generally required for antenna testing, but they are mainly used for measuring 5G antennas by securing uniform radio wave characteristics for measurement in a small space using a radio reflector.

To address this problem, the National Radio Research Agency (RRA) succeeded in developing a module, a key component that combines measurement probes and receivers, through joint research with domestic universities over three years, and completed the establishment of a system (in Naju and Icheon) that can drastically improve measurement accuracy and measurement time.

According to the progress of development, the measurement time was reduced: 3.5GHz band measurement system (measurement takes around 100 minutes) was developed in the first year (2019) and 3.5GHz/28GHz double frequency band measurement system (measurement takes around 30 minutes) was developed in the second year (2020).

In the third year (2021), the RRA succeeded in reducing the measurement time to around 12 minutes by simultaneously measuring radio waves emitted from 5G terminals in 360° direction by placing the previously developed core component module in a circular structure at high density.

※ Five patent applications (four domestic and one overseas) and three international SCI-level papers have been published through this study.

The RRA is promoting international standardization of the newly-developed high-speed measurement system and measurement technology to widely distribute them across domestic and foreign conformity assessment institutions and 5G-related

manufacturers, and is also supporting its commercialization by creating a industry-academia-research institute committee.

The RRA plans to conduct additional research so that the new system and technology can be used in a complementary manner with existing 5G measurement facilities by applying the core technology to the Terahertz band (100GHz to 10,000GHz).

In commemoration of the successful development of the high-speed measurement system of 5G antennas, the RRA held an international workshop on 5G and future radio measurement, attended by experts from domestic and foreign universities, industries, and measuring instrument manufacturers.

Vice Minister Cho Kyeonsik of Science and ICT said in his congratulatory speech, "Developing the world's first 5G high-speed measurement system is a significant step forward in the field of radio wave measurement, and at the same time, it has raised the competitiveness of Korea's 5G industry ecosystem."

He said to the experts from industry, academia and research experts who attended the workshop, "It will soon be three years since Korea launched commercial 5G networks for the first time in the world, and I ask you to play a major role in the development of 5G and next-generation network technologies, the diffusion of convergence services, and the growth of the entire ICT industry."

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