Introduction of the ICT Regulatory Sandbox

As information and communication technologies such as artificial intelligence, big data, robots, 5G, and healthcare develop at the speed of light, new technologies and services that combine information and communication technology, digital technology, and traditional industries are rapidly being released. It is ideal to prepare relevant laws and regulations in advance so that new services using innovative, cutting-edge technologies can be released in a timely manner; however, there are limitations on the ability to keep pace with technological developments. In addition to there being insufficient information necessary for legislative maintenance, it takes a considerable amount of time to overhaul laws and regulations. In order to overcome these limitations, support measures are required to launch or test-run specific new technologies and services on a case-by-case basis, apart from the existing legal system.

In October 2015, the Financial Conduct Authority (FCA), the UK's financial authority, promoted the Project Innovate policy to maintain its status as an international financial hub. One of the five policy instruments included in the policy is the regulatory sandbox[1)]. The UK regulatory sandbox does not apply all or part of the current regulations so that innovative products and services, business models, and delivery systems can first be released and tested and verified under certain period, place, and size restrictions. The preemptive introduction of the regulatory sandbox for new technology in the UK's financial sector is judged to be a timely policy that took as a lesson the Red Flag Act of 1865, which hindered the development of the UK's automobile industry.

Korea has also benchmarked market demand and British policy to supplement existing systems, such as provisional permits, while introducing ICT and regulatory sandboxes such as negative regulation principles and regulatory exceptions for pilot projects. It has been four years since it was fully implemented (January 17, 2019), after the National Assembly's resolution (September 20, 2018) and promulgation (October 8, 2018).

Main content

Highlights of the ICT Regulatory Sandbox

The main contents of the ICT regulatory sandbox are as follows.

First, it is a negative regulatory principle (priority permission, post-regulation). Businesses related to new information and communication convergence technologies and services are first permitted to function, and later regulated if they are found to in any way harm the lives or safety of the people and the environment. (Information and Communication Convergence Act Article 3-2)

Second, if there are no standards in the laws and regulations that are the basis for various permits for new technologies and services, or if it is unclear or unreasonable to apply the standards in accordance with the laws and regulations, commercialization, such as market launching, is temporarily permitted. The extension period is extended from once a year to once every two years, and the head of the relevant agency is required to revise the grounds for new technologies and services for which provisional permission is granted within the effective period. (Article 37 of Information and Communication Convergence Act)

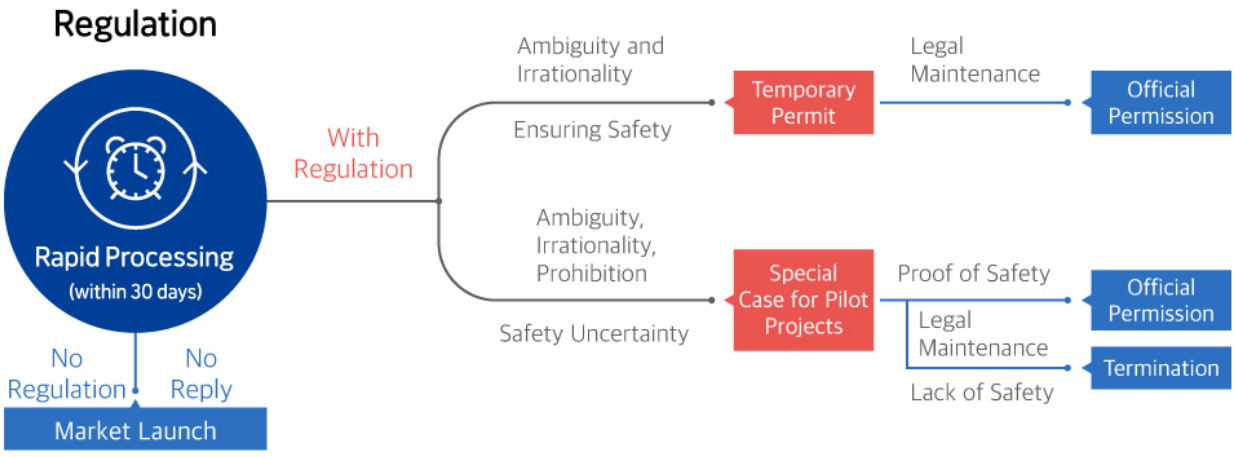
Third, regardless of the type of law or regulation, it is possible to check whether permission is necessary or not. (Article 36 of Information and Communication Convergence Act)

Fourth, if it is impossible to apply for permission for a new technology or service due to the provisions of other laws, or if it is difficult to implement a project because it is unclear or unreasonable to apply set standards, all or part of the regulations are not applied for technical verification. (Information and Communication Convergence Act, Article 38-2)

Fifth, for the protection of users, business operators with special pilot-project or temporary permits cannot escape liability for damages to users unless they can prove that there was no intention or negligence involved. (Article 37 Paragraph 8 of the Information and Communication Convergence Act)

The Office of Government Policy Coordination is in charge of the operation of the ICT regulatory sandbox system, the Ministry of Science is responsible for ICT convergence and related tasks, such as application and acceptance of systems and consulting, which are supported by the National IT Industry Promotion Agency.

The regulatory sandbox begins with pre-consulting. When requested by a company, the agency in charge of the application process specifies the business model and provides legal advice and preparation of application documents. Depending on the company, expedited processing that confirms whether or not it is regulated within 30 days is preceded. If it is confirmed that there is no regulation as a result of expedited processing, it can be put on the market immediately. If there is a regulation involved, but it is ambiguous or unreasonable, and stability is secured, a temporary permit is implemented, and when the provisional permit is followed by a revision of the law, a formal permit is issued. If the regulation is ambiguous, unreasonable, or prohibited, and safety is uncertain, a special case for a pilot project can be applied for. If safety is proven after the pilot project, formal permission is granted after revision of the applicable law, and if the need for regulatory revision is acknowledged but additional grounds for safety are judged to be needed, the right to request revision of the legislation can be exercised to extend the verification period. The specific procedure is shown in the figure below.



Achievements and Major Cases

Since the implementation of the ICT regulatory sandbox system, a total of 162 operators have been designated for temporary permits and as cases by the end of 2022, special pilot project with sales of 114.6 billion won by participating companies, 179.6 billion won in investment, and 4,097 new employees. Typical examples include mobile electronic notices that allow administrative and public institutions to conveniently receive various bills, formerly sent by paper, through mobile devices such as apps and text messages; new passenger transport services that allow separate fares to ride taxis together; non-face-to-face rehabilitation services that allow patients to conveniently receive rehabilitation at home or have a consultation with a pharmacist in a non-face-to-face manner late at night. There has also been the introduction of video vending machines where over-the-counter medicines can be safely purchased.

Directions for Development

The ICT regulatory sandbox has served as a window for innovation to help new and innovative information and communication, and digital technologies and services to be rapidly launched in the market in a traditional regulatory environment. Although there have been tangible results, the need for improvement in reconciliation of conflicts with stakeholders and swift legislative changes have been raised. Therefore, the government supports early release from conflict-of-interest projects, improved procedures for processing identical and similar tasks, and prompt decrees after designating temporary permits and special cases for pilot project testing. Plans to expand support such as maintenance are being reviewed.

Companies should actively utilize regulatory confirmation, provisional permission, and special cases for pilot project testing to provide pilot services and demand regulatory improvement. There is a limit to the legal system's ability to immediately incorporate newly launched business models by applying innovative technologies emerging in real time. However, even if it is difficult to launch immediately due to regulations, empirical data can be obtained by fully utilizing the current system, such as the ICT regulatory sandbox. In addition to commercialization, there are various opportunities such as pilot project testing expenses and publicity.

1) Kim, S. (2018, December). The UK's Regulatory Sandbox and Its Implications. KIRI Report, 435.

A regulatory sandbox is a system that exempts existing regulations for a certain period of time when a new product, new technology, new service, or new business model is launched. It was launched in the UK in 2016 to foster the fintech industry and was adopted as one of the reform measures as the Korean government confirmed the introduction of the regulatory sandbox in 2017. China, Japan, and the United States have also introduced regulatory sandboxes and are applying them according to each country's circumstances. Let's look at these overseas cases and think about ways to utilize regulatory sandboxes.

ICT Regulatory Sandbox: The Japanese Case

Japan operates a unitary system with the Japanese government as the control tower and utilizes project-type and region-limited regulatory sandboxes in order to escape from a mid- to long-term economic recession and promote sustainable economic development. The regulatory sandbox of new economic policy packages, such as autonomous driving, transportation, construction, health and medical care, finance and commerce, agriculture, forestry and fisheries, tourism, sports, and culture and arts, is being applied and implemented. Japan's regulatory sandbox develops a business model through trial and error based on five principles (empirical priority, appropriate risk management, a governmental unitary system, empirical support and post-verification, and top management involvement) for the establishment of Society 5.0.

The project-type regulatory sandbox is a system that first conducts business substantiation, verifies the commercialization potential of innovative technologies or business models, and then reviews regulations using the data obtained through the substantiation. Panasonic Corporation's IoT-based high-speed PLC (power line communication) was verified by installing HD-PLC in home appliances and wiring devices in houses, along with PLC devices. In addition, criminal transfer prevention notification services, preparation of regular building lease statements using electronic contract systems, unmanned sales cafes using robots, healthcare, and P2P insurance have proven to be successful.

The region-limited regulatory sandbox was newly established within national strategic special zones to expedite and facilitate verification testing of new technologies unprecedented in the past. However, the scope is limited as it is limited to autonomous driving, unmanned aerial vehicles, and radio waves. For example, Nippon Mobility operates an unmanned technology on large buses produced by Sotetsu Bus in Asahi-ku, Yokohama City; and in Sendai City, there is a verification experiment in which drones are being used for aerial photography.

ICT Regulatory Sandbox: The U.S. Case

In 2018, Arizona, the first state in the United States to introduce a regulatory sandbox that allows testing of innovative financial products and services related to fintech, amended their law. The law allows participants to test-run innovative financial products and services within limited restrictions without the need for state permits or regulatory requirements. After approving Omni Mobile Co., Ltd., a mobile payment platform company, as the first participant, it verified a cost-saving and fast remittance platform at a resort in Arizona using central management infrastructure. In addition, by signing an information-sharing agreement with Taiwan's Financial Supervisory Commission, it provides opportunities to develop and test-run fintech products between the two countries.

The state of Wyoming also enacted the Fintech Sandbox Act in 2019, granting a 24-month pilot test period in the fintech field and has consumer protection regulations that utilize background checks such as consumer guarantee bond issuance and criminal records. In addition, Wyoming enacted a regulatory sandbox law in the field of medical digital innovation, which aims to protect consumers and improve inconveniences through testing, monitoring, and evaluation of medical digital products and services as well as essential personnel, such as medical digital technology experts. The digital health field includes a wide range of technologies, including software, advanced analytics, artificial intelligence, cloud use, cybersecurity, interoperation, medical device data systems, mobile medical apps, and wireless medical devices.

Kentucky implemented the InsurTech program in 2019, and beta-test sandboxes have been newly established and implemented in the law. Allowing insurance-related innovation programs to be tested, participating companies provide detailed financial statements with proof of assets of at least $25,000 and select an insurance innovation officer to review and process applications to determine participants.

ICT Regulatory Sandbox: The Chinese Case

China has established Comprehensive Reform Pilot Zones to solve the problem of restricting local economic development and grants the right of priority for institutional reform to local governments that establish pilot zones. Priority selection was used as a major means for institutional reform during China's reform and opening process in 1978. Local governments operate the system first so that systemic transition can occur naturally, and depending on the results, it is decided whether to expand the system nationwide. In addition, it grants the right to lead in institutional innovation to local governments, observes and implements laws, and executes legislative authority according to statutory procedures. By granting the right to trial and error, and allowing for policy failure, it aims to create a social atmosphere in which institutional reform can be carried out without fear of consequences.

China's Xiong'an New Area is a key project of Xi Jinping's new urbanization policy. By constructing a smart city based on smart technology, it aims to overcome the phenomenon of excessive concentration of population and functions in Beijing and develop the less-developed Hebei Province. In the meantime, large corporations have preoccupied the Chinese market for smart city development, but companies such as Baidu, Alibaba, and Huaxiaxingpu have established headquarters or branches in the Xiong'an New Area to proceed with urban development. Beginning at the end of 2019, the regulatory sandbox was introduced in China as well and is in the process of being expanded to six cities: Shanghai, Chongqing, Sunshen, Xiong'an in Hebei Province, Hangzhou, and Suzhou. Among them, in the Xiong'an New Area, a smart city is operated by a regulatory sandbox mainly focused on the financial sector and is mainly organized with financial measures to support the migration of enterprises and the private sector.

Challenges to Korea's ICT Sandbox from Overseas Cases

Despite the development of innovative technologies that can bring customers closer, there was the institutional inconvenience of making it difficult to launch immediately due to the regulatory system. Regulatory sandboxes are expected to be an opportunity to get economic benefits and various positive effects beyond these inconveniences.

Looking at the examples of regulatory sandboxes in China, Japan, and the United States, it is recommended to apply them appropriately to the situation in Korea.

Reference

- Regulatory Improvement Measures to Overcome Growth: Focusing on Regulatory Sandboxes.
- Measures to Enhance the Effectiveness of the Regional Innovative Regulatory Sandbox System: Focusing on Smart City Regulatory Sandboxes and Special Regulatory Free Zones.
- STEPI Insight, No. 286.

Household robots seen in sci-fi movies ten years ago have become a reality, and now robots can actually make food.

Let's hear the story of a researcher who designs and programs these robots.

Q

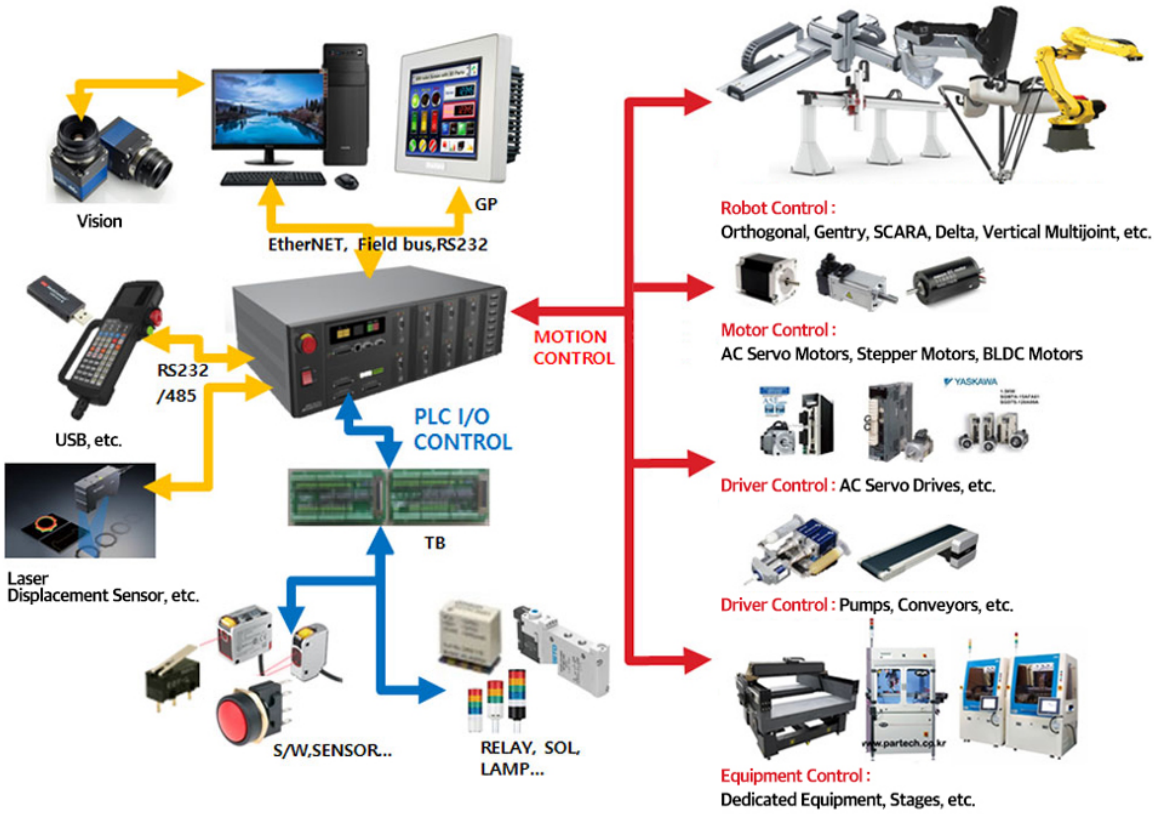
Hello, please introduce yourself briefly to our readers.

Hello, my name is Jeong Jae-yun, I am a researcher working at Robotech Research Center.

Q

What kind of work does Robotech do?

We are mainly engaged in manufacturing and supplying automation system equipment and industrial robots. We manufacture and supply SCARA, articulated robots, and desktop robots, which are mainly used on LCD display lines, automobile parts production lines, and semiconductor parts production lines. In addition, we have developed a smart cooking robot that can automatically cook about 100 types of food, including fried foods, Korean, Chinese, Japanese, and Western foods.



Q

What kind of work are you in charge of at Robotech?

Currently, I am in charge of robot controllers, GUI (graphical user interface) and controllers, and internal control software-related work.

Q

What kind of technology is representative of Robotech, and how is it being used?

Typically, there is robot control technology for multi-axis robot control. In the case of standard robots, a controller is required for each robot to utilize multiple robots, but in the case of our controller, it is designed to control multiple robots with one robot controller, so it can be used in multiple-robot sites.

In addition, the cooking robot currently under development can cook various foods such as fried chicken, noodles, soups, and stews.

Q

What got you interested in robot-related technology?

I became interested in robot-related fields while watching robots being used at industrial sites and various other places.

Q

Could you tell us one of the strengths of your company?

Since multiple robots can be operated with one controller, it is easier to make equipment.

Q

Please tell us a memorable episode that you've had while working.

I once used robots to carry out tasks at an agricultural site, so I felt that the use of robots was not limited to only industrial fields.

Q

What kind of skills are required to join Robotech?

You need to have experience or have studied in related technologies such as mechanical design, firmware, and software programming.

Q

What do you think is the future of robotic technology?

Currently, the demand for the use of robots within the industrial field is gradually increasing. Now, it has advanced into the food and beverage fields, such as coffee shops and fried chicken restaurants, and continues to develop to find additional demand.

Q

How do you feel while working for the company?

Robots are used in more fields than I had imagined, and I feel that they are continuously evolving to be used in even more fields.

Q

Do you have any future goals?

We plan to focus on technology development so that our robots can be used in more diverse fields.

Q

Any messages to give to our ICT Hot Clips readers?

We will do our best to make better robots through continued research and development. So far, we are only known among companies that deal robots, but we will do our best to let the public know more about our company. Thank you.

T3Q CO., LTD.

☑ General Status

- **Implementing Agency**
  National Information Society Agency
- **Business Details**
  Big data center fostering and platform construction

☑ Company Status

- **CEO**
  Park Byung-hoon
- **Business Type**
  AI big data platform
- **Year of Establishment**
  2007. 01
- **Homepage**
  http://www.t3q.ai/

☑ Key Accomplishments

AI platform T3Q.ai 3 acquired GS certification for the first time in Korea (2019).

Development of big data/AI integrated platform (2017).

Developing and providing platform and AI services to the defense industry and public institutions.

All-in-one Solution Actualizing Various AI Services

Korea's AI investment and research are carried out centering on large corporations; currently, they are intensively applied to specific services such as simple product consulting and product guide. However, AI technology will be used in diverse fields and will be advanced. Consequently, many companies are investing considerable resources and manpower in specialized AI service or function development depending on strategic positioning.

Big data that becomes the basis of AI technology has been constructed for only some large corporations, with small and medium businesses (SMBs) lacking high-cost investment capacity for state-of-the- art intelligent information technology. Worse, it is almost impossible for those SMBs to make high- risk investments, whose immediate effects are not revealed in the short term. If the trend persists, such may lead to deteriorating dynamism and innovation capability decline in the overall economy. T3Q launched T3Q.ai by concentrating all its capabilities on building a win-win base since 2015 by creating a platform through which any company can develop AI services easily and fast.

T3Q endeavored to reduce the software development time to 1/3 and improve quality threefold, having focused on securing software technological capabilities such as open source, software architecture, big data, IoT, deep learning, and development methodology for 10 years since its establishment in 2007. The company has been supplying technologies and solutions to Korea's leading companies. To respond to and push forward with the massive trend of the Fourth Industrial Revolution, T3Q has concentrated all its capabilities and resources on R&D of big data and AI. As a result, its capabilities have been recognized by supplying its big data and AI platform and services to large corporations and public institutions.

The real-time universal AI/big data integrated platform T3Q.ai is a big data/AI integrated platform for large-capacity data processing and application of intelligent analysis technology. T3Q.ai is an all-in-one solution embedded with big data processing and AI technology so that various AI services can be easily realized provided there is data. Firms using T3Q.ai can considerably reduce the time and costs required to embody the AI service. On-demand AI service development is also possible depending on the firms' needs, because T3Q.ai is designed with a flexible structure that makes customizing easy. The company has been focusing on the development of diverse AI services since launching the T3Q.ai.

Quick and Easy Development of Excellent AI Services

T3Q.ai is a platform that acquired GS certification for the first time in the AI platform field, and it has a structure that can be expanded indefinitely based on real time, intellectualization, and edge AI characteristics. Through built-in model and service in object recognition, natural language processing (TA), and reinforced learning fields, excellent AI services can be developed quickly and easily. T3Q's platform is recognized for its technological capabilities and know- how by the Ministry of Unification, National IT Industry Promotion Agency, Ministry of SMEs and Startups, and Korea Internet & Security Agency.

T3Q was asked to propel and participate in the Lifelog Big Data Platform and Center Construction project as part of Digital New Deal in 2020 while maintaining a cooperative relationship with Wonju Severance Christian Hospital to propel an AI and big data project in the medical field. Lifelog enables easy use of the medical record data made when individuals use various medical institutions' services by combining and analyzing them to make good-quality data and through data quality verification and non-identifying and convergence processing. The AI service based on the data is provided from the platform. By consolidating technologies such as data definition, registration, verification, distribution, organization and authority, and data linkage API required for distribution structure, T3Q made a new sub-platform that expands the existing solution. This is a technology that is good to apply to various data-centered platforms, and its bright future is expected.

Until the Day When AI is Applied to All Businesses

Big data and AI platform are the foundation of T3Q, and they are core factors in pursuing the ultimate goal of the company. The big data processing and distribution technology added or advanced through Digital New Deal can be applied to any industry. TQ3 is participating in the Dr. Answer 2.0 project, a state project of MSIT, so the company plans to have the medical big data processing technology spread across the medical sector.

TQ3 has been accumulating technologies since 2015 when it started performing big data projects. In 2017, the company developed Korea's first AI/big data integrated platform. The AI platform acquired GS certification in 2019 for the first time in Korea. CEO Park Byung-hoon remarked, "I am proud that our technological capabilities and know-how—which have been built up by accepting and developing big data and AI technologies slightly ahead of others in Korea and providing platforms and solutions to the defense industry, public institutions, and companies— are ahead of competitors." TQ3 is confident to accept and tackle any challenges as an ever-prepared company."

TQ3 plans to embed the 29 best practices as the combination of 7 types of data used in AI (text, voice, image, video footage, satellite, log/numeric value, binary) and 4 types of AI tasks (regression, classification, clustering, abnormality detection), add the content to follow and learn, and provide them so that anyone can learn AI and discover and develop AI services. Through this, TQ3 expects to resolve all citizens' AI knowledge gap and to apply AI to all industries.

TIME LINE

2007. 01.

Established T3Q Co., Ltd.

2010. 04.

Changed to research-certified venture business (technology-certified venture business in 2008)

2012. 11.

Cloud Box Excellence Prize at the Korea Software Technology Awards

2013. 12.

Development and operation of Website Healthcare Center

2014. 07.

Signed an MOU with KAIST (SSPL research and embodiment)

2019. 05.

T3Q.ai v3 platform acquired good software certification

2019. 12.

T3Q.ai won the Grand Prize at the Korea Software Technology Awards Korea IT Architecture Awards (Science and ICT Minister's Prize)

2020. 05.

Ministry of Science and ICT (MSIT) Selected as a lifelog big data platform construction project

2020. 06.

MSIT Selected as Digital New Deal Best Practice of the Month

2022. 01.

Artificial Intelligence Industry Association AI+X Selected as one of the top 100 companies

해랑기술정책연구소

HAERANG TECHNOLOGY AND POLICY RESEARCH INSTITUTE

☑ General Status

- **Implementing Agency**
  National Information Society Agency
- **Business Details**
  Smart village diffusion and spread

☑ Company Status

- **CEO**
  Baek Sang-gyu
- **Business Type**
  Academic research service and R&D service
- **Year of Establishment**
  2017. 01

☑ Key Accomplishments

Developed a drone-enabled tideland fishing ground small octopus resource amount calculation system.

Developed Illegal fishing monitoring and alarm service using IoT technology and intelligent CCTV.

Developed a marine mammal exploration technology using unmanned, remote exploration technology.

R&D Planning Consulting Specialized Company with In-Depth Understanding of Oceans

The Haerang Technology and Policy Research institute, established in 2017, is a policy development and R&D planning consulting specialized company in the marine-fisheries science and technology sector. Haerang has performed over 250 cases of research in the science and technology area with various ministries(Ministry of Oceans and Fisheries, Ministry of Environment, Ministry of Science and ICT).

Through this, Haerang secured operational experience, technological understanding, and know-how on research and technology development projects. To maximize these merits, Haerang set up and opened an affiliated research center in 2017. As the research institute has developed an AI-enabled smart fishery management system, agriculture, forestry, and marine- based smart healthcare technology, and marine mammal exploration technology using unmanned remote exploration, Haerang boasts differentiated competency from other AI companies.

The background of Haerang started from a realization that it would be optimal for professional manpower that specialized in the marine biology field to perform a planning and consulting business. While working at the Korea Institute of Marine Science and Technology Promotion (KIMST), the CEO pursued various projects, and found that general consulting firms had below- standard know-how about the oceans. In contrast, expert professionals in the marine field lacked good know-how of business planning. The CEO felt a need to close this market-specific gap, having majored himself in the marine biology field, and launched a business based on the know-how amassed during working in relevant fields.

Bright Future in the AI-Enabled Marine and Fisheries Domains

Haerang supports technical planning or policy establishment for state-run/ public agencies related to marine-fisheries science and technology, and focuses on marine and fisheries services through AI- enabled image analysis. With the Smart Support and Management System for Small Octopus Fishing in Tideland, Haerang secured a drone-enabled tideland fishing ground small octopus resource calculation system (patent application No. 10-2021-0187222) and illegal fishing monitoring and alarm services using IoT technology and intelligent CCTVs (patent application No. 10-2021-0187211). In addition, Haerang has been investigating the porpoise inhabitation situation since 2019 based on the marine mammal exploration technology using unmanned remote exploration technology.

With the prospects of the marine-fisheries service market is bright through AI-enabled image analysis, Haerang has in-depth operational experiences, advanced technical know-how, and prowess as to R&D in the marine-fisheries science technology sector. Although there are other market players with advanced expertise and professionalism in the marine-fisheries and AI domains, respectively, only a few companies can be found with advanced expertise and professionalism in both domains in tandem. This can serve as Haerang's competitive advantage.

Service Development Using Unmanned Drone Images and AI

Because AI technology is currently applied in various domains, cases in which AI technology is combined with the marine-fisheries domains were searched for. As for small octopus fishing operation, it was found that small octopuses could be found by digging up the tideland, but fishing was carried out by checking for bubble spots generated by small octopuses and estimating the target location. It was clear that small octopuses' bubble spots can be recognized and identified through the model developed by Haerang, which participated in the ICT Fund Project when the research institute needed to collaborate with firms in other technological fields.

The project in which Haerang is currently participating entails smart support and management system for small octopus fishing in tideland, while the project is undertaken to resolve challenges of fishermen in the Sinan region, whose main source of livelihood is small octopuses, and to efficiently manage the natural supply of small octopuses. Haerang has developed a calculation system for small octopus resource in tideland using unmanned drone images and AI. An precise topographic map was drawn with unmanned drone image, and constructed AI algorithms and a service platform through AI learning data (over 60,000 cases) to estimate the small octopus resource amount. Moreover, Haerang has developed an illegal fishing monitoring and alarm service using IoT technology and intelligent CCTV, and is running a pilot test it in Docho-myeon, Sinan-gun.

Impacts for Digital Transformation in Agricultural and Fishing Villages

ICT Fund gave Haerang a strong confidence that they can succeed and supported Haerang's public relations. The work activities of Haerang were cited to represent best practices in foreign media outlets and seminars. Haerang experienced new policy support business creation (smart small octopus fishing support) last year through the convergence between ICT technology and policy support factors, and has accomplished targets. This proven experience had a positive effect on enhancing Haerang's capability and on setting the direction for future policy (i.e. digital twin, policy simulator, integrated management system). Nobody expected that AI could recognize the bubble spots generated by tideland small octopuses.

However, if AI can learn the unique shape of the bubble spots generated by them, Haerang predicted that it could discern other tideland organisms' inhabitation holes, so they endeavored to prove this. The AI recognition technology for bubble spots generated by small octopuses was not developed as aprofit-making venture, but this can be well-adapted to diverse derivative smart technologies. Haerang seeks to continuously discover intelligent smart technology services in agricultural and fishing villages which are susceptible to the digital transformation divide. Through AI recognition algorithms as to bubble spots generated by small octopuses, Haerang is committed to more concerted efforts to recognize various organisms inhabiting tidelands.

TIME LINE

2017. 01.

Established Haerang Technology and the Policy Research Institute

2017. 03.

Set up the Haerang-affiliated research center

2018. 02.

Registered R&D service business

2019. 10

Relocated head office to Gyeonggi R&DB Center, Gwanggyo-ro, Suwon-si, Gyeonggi-do

2021. 06

Selected for the 2021 Smart Village Service Discovery and Demonstration Competition Project by MSIT

VIRNECT

VIRNECT CO., LTD.

☑ General Status

- **Implementing Agency**
  National Information Society Agency
- **Business Details**
  Citizens' safety and quick response support through AI convergence

☑ Company Status

- **CEO**
  Ha Tae-jin
- **Business Type**
  Software development and supply
- **Year of Establishment**
  2016. 10
- **Homepage**
  https://www.virnect.com/

☑ Key Accomplishments

Domestic market invigoration of industrial XR solutions.

Domestic IT technology competitiveness consolidation by offering Virnect's solution / service through Virnect's own technology.

Support for inefficient industrial sites' digital innovation.

Virnect Boasts Top Level Technological Capabilities in the Industry

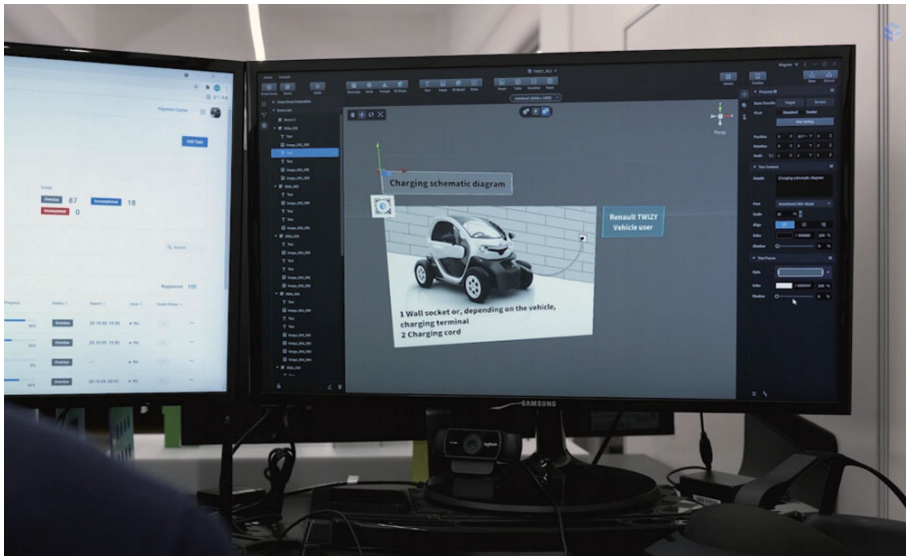
Since the Serious Disaster Punishment Act was enforced, firms have been devoting themselves to safety control inspection in industrial sites. The Serious Disaster Punishment Act to punish violations of safety and health protection obligations aims to prevent damage of human life and protect workers'life and body. The key point of the Act is to consolidate punishment level upon violation of safety control obligations and let companies construct and implement a safety and health management system.The Act is greatly expected to lower fatal human life accidents or the accident / incident occurrence rates in industrial sites from the aspect of devising safe working environment for workers. Adoption review of industrial safety solutions combining cutting-edge technology is on the rise to prevent industrial disasters/accidents.

Virnect with varieties of experiences in industrial sites presents methods to promote industrial safety and work efficiency by accurately recognizing industrial sites through the Virnect-developed XR (virtual convergence technology) solution and making a manual for accident prevention with 3D content.

Most AR- or VR-based software firms tended to concentrate on contents (tourism, PR, etc.) at the time of their establishment. However, Virnect has carried out development, focusing on industrial software for differentiation. The company developed industrial AR (augmented reality) collaboration software that can emphasize Virnect's technological capabilities, after recognizing a need for remote collaboration from its customers (Doosan Heavy Industries & Construction, KEPCO, etc.) at the time of its establishment. Centered on a research center in Vienna, Austria and technology research center in Korea, Virnect secured world top-notch XR core source technology and XR development platform SDK (Software Development Kit), and has been supplying industrial XR solutions and products optimized for various industries. The products are the solutions through which complex and dangerous work can be safely handled by synthesizing virtual objects or information in the actual industrial sites. These products are applied to diverse industrial sites including manufacturing, energy, EPC, construction, and heavy industries.

In addition, Virnect has top-level technological capabilities in the industry in view of 107 intellectual property rights, 36 prizes, TI-2 grade technology credit rating corresponding to “very excellent” from NICE TCB, as well as experiences of performing over 100 projects.

Enhancement of Industrial Sites’ Safety and Work Efficiency



As a review to adopt the XR solution for safety management along with efficiency increases after the enforcement of the Serious Disaster Punishment Act, Virnectis presenting a method to accurately recognize industrial sites and enhance industrial safety and work efficiency with 3D content of the manual to prevent accidents. The company is supporting the XR solution to be applied to all industrial sites suitable for features of various industrial sites and major customers’ needs. In particular, Virnect proposes an enhanced solution through robots or drones so that monitoring can be performed in a situation or in an area that’s not easily accessible for a person. The development of hardware to which the XR solution can be applied is carried out fast, so the enterprise XR market is predicted to grow fast through the harmony of industrialtrend,market change, and government policy.

Above all, as digital transformation is being accelerated due to COVID-19, and the concept of metaverse in which online virtual space coexists with physical space spreads, Virnect’s business expansion and direction, along with its core technologies, are envisioned. Since Virnect’s marketability and technological capabilities are recognized thus far, the company plans to accelerate growth speed through construction of the metaverse ecosystem. The company plans to develop technology for the platform business and propel business growth together with ecosystem construction through collaboration with its business partners.

Plans to Diffuse Korean Firm's Excellence and Technological Capabilities Around the World

Virnect CEO Ha Tae-jin mentioned, "Although firms may feel the XR solution unfamiliar in the initial stages of adopting it, more companies are continuously demanding our products that support intuitive collaboration." He added, "We will play a role in resolving various problems including inefficiency and risk factors in the industrial sites. Industrial sites' digital innovation through Virnect's solutions still continues." He hopes that the new deal on the digital project can be of great help to spread the industrial sites' technological innovation.

As Virnect has placed itself as Korea's top industrial XR solution company, it plans to enter the overseas markets, not just being complacent with top spot in Korea, and to showcase its excellence and technological capabilities to the world in 2022. Based on the current industrial XR solutions, the company plans to expand the XR platform business, and strive to foster Korean XR talent in Korea through operations of XR Academy. Virnect is expected to make a reputation in foreign markets and become the top metaverse platform company in the world beyond being the top company in Korea in 2022.

TIME LINE

2016. 10

Eastablished Virnect Co. Ltd.

2017. 11

Founded research center

2017. 12

Launched Virnect Remote AR

2018. 03

Released Virnect Make 1.0

2019. 09

Attracted series A investment (KRW 9 billion)

2020. 05

Established a Research Center in Vienna

Ministry of Science and ICT Selected as an XR Flagship project

2020. 09

Integrated solution Launched VIRNECT Solution 2.0

2021. 10

MSIT Selected as the Digital New Deal Best Practice of the Month

2021. 12

Attracted Series B investment(KRW 30 billion)

RIST
재단법인 포항산업과학연구원

RIST (RESEARCH INSTITUTE OF INDUSTRIAL SCIENCE & TECHNOLOGY)

☑ General Status

- **Implementing Agency**

  National IT Industry Promotion Agency
- **Business Details**

  AI convergence energy efficiency

☑ Company Status

- **CEO**

  Nam Soo-hee
- **Business Type**

  R&D, testing and analysis
- **Year of Establishment**

  1987
- **Homepage**

  www.rist.re.kr

☑ Key Accomplishments

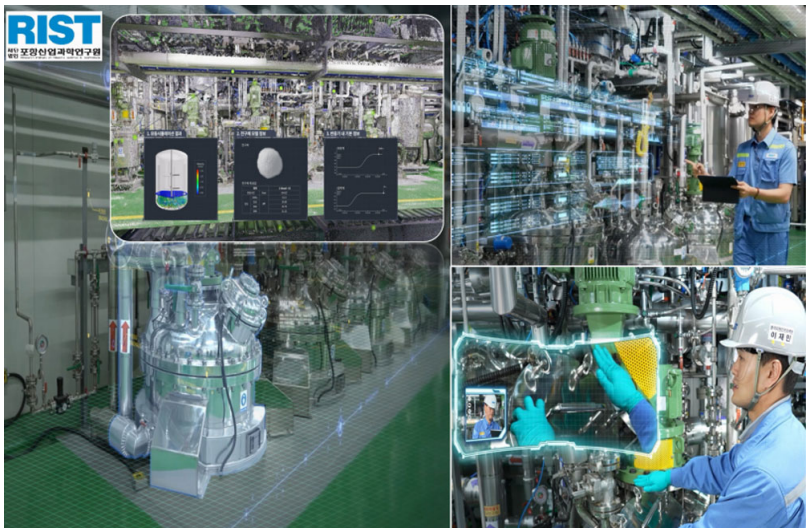
Expansion of industry-academia-research cooperation and routinization of Corporate Citizen to secure future core capabilities.

Construction of super-gap commercialization infrastructure through competitiveness consolidation of the next generation products of secondary battery cathode and anode materials.

Early obtainment of commercialization technologies for fine dust reduction, energy efficiency, byproducts utilization, and hydrogen / industrial gas.

Smartification of AI and robot-based safety process analysis technologies.

Growing Further through Digital New Deal Project



RIST is a practicalization-specialized research institution leading the POSCO Group and national industrial development through innovative technology development. Since its establishment with the capital of POSCO in 1987, the industry (POSCO)-Academia (POSTECH)-Research (RIST) cooperation system was constructed for the first time in Korea, and the RIST has established itself as the cradle of practicalization technology development. RIST focused its research area in the next generation steel manufacturing technology in the initial stages of its establishment, expanded to special materials and environmental energy areas in the 2000s, and is currently discovering new growth engines in the future core industry, namely secondary battery materials and hydrogen and smart safety fields.

The secondary battery material industry is rapidly growing along with the electric vehicles'growth, and the POSCO Group is vigorously investing in the cathode material market for secondary batteries. RIST has been engaged in the XR-based manufacturing facility digital operation system construction project out of the XR Flagship Project Support project propelled by the MSIT since 2020, and will participate in the project by the end of this year.

RIST felt challenged to carry on the mission of verifying the secondary battery cathode material technology within three years of short period of time, because RIST had no experience of actualizing to the last phase of digital twin, that is the intelligent digital twin, in the Korean manufacturing sector. However, RIST could verify the solution with high completion through collaboration with the institutions (KETI and ETRI) and solution expert firms (Onmakers, Virnect, and Stance) participating in the project within short period of time. RIST is currently carrying out the intelligent twin phase out of the three phases (connective twin-simulation twin-intelligent twin).

In the connective twin phase in 2020, RIST demonstrated realization of manufacturing space duplication, and the XR-based(extended reality) remote collaboration and education / training solution in the secondary battery cathode manufacturing process. In 2021, RIST actualized the simulation twin that can simulate cathode material process and was developing the intelligent twin technology to reduce gap between twin model and actual equipment.

Before participating in the Digital New Deal project, RIST had focused on coming up with technology to resolve problems occurring in the process, but RIST could obtain desired results quickly through collaboration with firms with the relevant solution, while naturally using the recently hailed digital solution including big data, AI, network, and platformas a means to solve the problems in line with digital transformation, as RIST was participating in the Digital New Deal.

Fostering Small Hidden Champion Companies through Technology Diffusion beyond R&D

RIST plans to demonstrate the XR technology and digital twin technology in the pre-manufacturing process covering the cathode material development, production, and maintenance after starting technology development to apply the digital twin- based XR technology to a secondary battery material (cathode material) pilot manufacturing plant, and then expand the technology.

RIST embodied 3D virtual manufacturing space by scanning the real-constructed manufacturing space including equipment and constructed digital twin, based on real time data linkage-possible hybrid that occurs in the manufacturing space. RIST is currently propelling verification commercialization to a demonstration plant and a real plant by constructing an AR-based (augmented reality) remote collaboration solution and an education / training solution to support Argentina's salt water lithium plant (4,000m above sea level).

RIST is a practicalization expert institution, commercializingexcellent technologies based on its technological capabilities, and is taking initiatives in fostering small hidden champion companies through technology dissemination. RIST could produce good results by performing practicalization research close to commercialization in view of the atmosphere of the research institute.

Win-Win Growth in the Secondary Battery Field through Digital Twin Technology Exchange

The digital twin technology can resolve various problems that cannot be resolved with existing technologies, and can meet new demand from both industrial and private sectors. Therefore, experts predict that more companies and organizations will adopt digital twin technologies. Like other key IT technologies related to transformation to the digital economy, the coronavirus is expected to play a role as a driving force of growth for the digital twin technology.

Although the digital twin technology is at its introduction stage in Korea, the relevant technology is predicted to rapidly grow in line with the dramatic digitalization of society and economy. Consequently, if firms that will participate in the Digital New Deal continuously try to enhance productivity and create new business opportunities using the digital twin technology based on good understanding of the Korean market environment, it can be a new growth opportunity amid rapidly changing economic confusion due to the COVID-19 pandemic. Even though firms can undergo very tough process and trial and error in order to challenge new technology fields as a pioneer, the experience can become foundation to broaden a vision to see the world, and they can grow as a leader group in the new fields.

RIST will continue to exchange digital twin technology with leading Korean secondary battery manufacturers through win-win collaboration for mutual growth, and make contributions to global cost reduction and quality competitiveness improvement in the secondary battery field.

TIME LINE

1987.

RIST established (POSCO invested all)

1995.

Designated as an internationally authorized testing institution in the metal field, first-ever as a private research institution

2009.

Declaration of specialized research institution vision for top practicalization in the world

2017.

Operation of a lithium production plant in commemoration of the 30th anniversary of establishment

2019.

Established Secondary Battery Material Research Center and Fine Dust Research Center

2020. 05

Ministry of Science and ICT (MSIT) Selected as an XR flagship project support project

2021.

Founded Hydrogen Research Center

2021. 03

MSITSelected as the Digital New Deal Best Practice of the Month