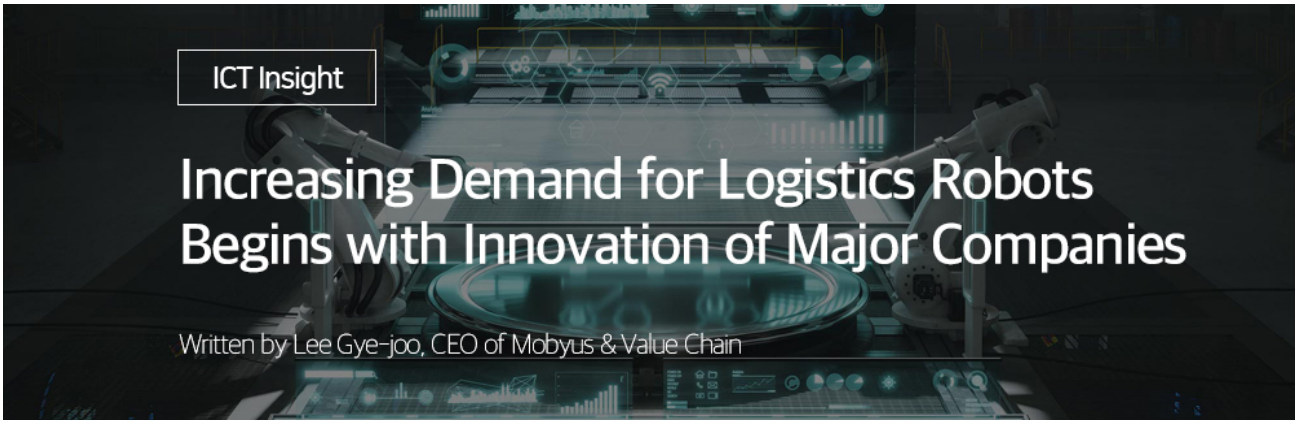
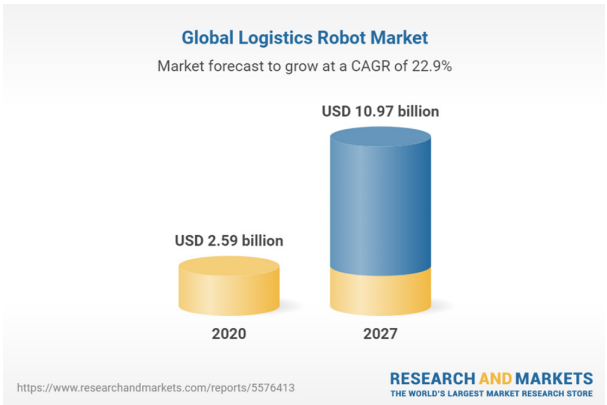


Rising Demand for Logistics Robots

The logistics industry has been experiencing chronic labor shortages in recent years. It is a common concern of all logistics sites to have difficulties in securing the skilled manpower necessary to secure logistics productivity and meet service levels. As both domestic and foreign countries are facing a common situation in logistics automation, efficiency, and maturation, logistics robots are attracting attention for manpower reduction.

Based on this interest, the logistics robot market continues to grow rapidly. According to market analysis data, the global logistics robot market size in 2020 was valued at US$2.585 billion and is expected to grow to US$10.97 billion by 2027, showing a CAGR of 22.94% during the period. (“Global Logistics Robot Market: Forecasts from 2022 to 2027,” Research and Markets, March 2022)

[Global Logistics Robot Market Size Forecast]



▲ Source : Global Logistics Robot Market - Forecasts from 2022 to 2027”, Research and Markets▲

In particular, logistics center automation and demand for collaborative robots in the logistics industry, which has experienced a surge in demand for logistics services and a shortage of field operation personnel in various areas throughout the pandemic, are expected to continue to increase. In addition, the fact that more companies are pursuing DX (digital transformation) is also accelerating the rate of logistics robotization.

Successful case

Example of Success in Logistics Innovation Through AMR Introduction

In the case of advanced companies in global logistics, Amazon of the U.S., XPO Logistics and Ocado of the U.K., and JD.com of China are firmly establishing themselves as leaders in the field through the active introduction and utilization of free-flow robots.

Amazon earlier acquired KIVA Robotics and introduced autonomous mobile robots (AMR) to its fulfillment center and has continued research on robotic picking equipment. In the case of XPO Logistics, it is making preemptive investments in logistics infrastructure innovation by building 85 last-mile hubs and introducing AMR to each of them with the goal of becoming the largest last-mile operator in North America. Ocado in the UK is also building a large-scale fulfillment center and hub model for its last-mile service for fresh food online.

[XPO Logistics Distribution Center Robot]

▲Source: XPO Logistics Homepage▲

In the case of GTP-type (Goods-to-Person) robots or AS/RS-type picking robots, it is necessary to secure a large space for field application, but AMR has the advantage of not requiring large facility investment because it autonomously drives between existing fixed racks and shelves installed in its logistics centers. This has significant implications, considering that most companies reviewing automation and unmanned logistics centers consider the initial investment cost required to introduce logistics robots as the biggest burden.

By working with logistics field workers with AMR-type cooperative robots, work efficiency can be greatly improved with a small number of personnel, while the barriers in field applicability and introduction cost are relatively low, attracting the interest of many companies reviewing logistics robots. This is highly likely to spread to domestic logistics sites at a faster rate than expected in terms of a balanced solution to manpower shortages intensified by factors such as the pandemic, logistics center enlargement, and population decline.

Realistic Possibility of Reviewing the Application of Logistics Robots

Self-driving technology, which was the biggest technical obstacle to the spread of logistics robots, has also evolved to a level in which it can replace in-house horizontal movement, flat/multi-stage rack work, and robot cooperation in the logistics center through technological maturity and stability. In addition, a product portfolio of unmanned vehicles and unmanned transport robots of various configurations is provided to support all services according to weight, height, and characteristics of work units by categorizing logistics field operations.

[Immediate Application to the Korean Standard Logistic Center
"Scenario+Product+Accessory+Software" Bundle Configuration]

▲Source: Mobyus & Value Chain Homepage ▲

The Importance of AMR Software

In Korea, improvements have been made to automation solutions for the logistics centers, but this has been carried out within the framework of the existing structure and has a limited aspect. In particular, until now, logistics center operations in Korea have not been able to monitor the progress of work in real time with field workers or optimize work in the center considering physical movement even if the work assignment is distributed through the system.

However, using an AMR data-based real-time connection between unmanned equipment, workers, and IT systems is now possible, and by virtualizing all locations of the logistics center modeling (digital twin), it is possible to configure an optimized work assignment and allocate instructions. In the distribution center, an environment where optimization algorithms can be applied to the digital twin technology has been created. A greater effect can be obtained if AMR is introduced and accompanied by optimized software innovation.

In that respect, Amazon in the United States can be said to be a representative success story that has achieved results through innovation at a different level. Amazon's success has been due to investments in logistics software. Amazon, which has been working hard to expand various logistics hardware infrastructure for a long time, has continuously invested in logistics technologies such as AMR software.

Based on the centrat organization of SCOT (supply chain optimization technologies), it is producing various outcomes through successful investment and development of AMR software. First, it builds a system that establishes and updates a five-minute fulfillment plan in real time, and succeeds in significantly reducing the working time from 60 minutes to 15 minutes, based on optimization logic. According to Amazon, the work efficiency of logistics workers has also improved by about 75% due to the reduction in working hours. In the storage sector, Amazon has succeeded in improving storage efficiency by 52% through randomized storage optimization (multi-SKU/bin logic). At the same time, shipment restrictions were minimized through dynamic loading and picking work assignments and creating effects such as dynamic work order allocation and readjustment response by securing various live data such as computer vision, IoT utilization location tracking, and KIVA robot utilization.

Directionality

Direction for the spread and stable operation of logistics robots

Rather than simply introducing AMR hardware, it is necessary to match the goals of the demand companies and supplier companies by applying a high-quality logistics automation and integrated operation service to the logistics site. Without robotics, there will be no future development of the logistics industry.

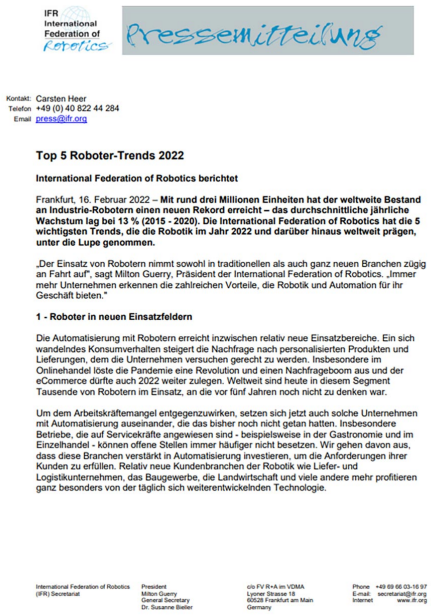
If autonomous cooperative AMR, which can be introduced for the purpose of collaboration with people without changing the current warehouse environment, and RaaS (Robot as a Service) subscription-type introduction are activated, the barrier to introducing robotics to logistics sites will be drastically reduced. Many companies and analysts believe that it will still be a long time before logistics robots can replace workers.

However, technology is rapidly evolving and investments are being made by paying attention to the efficiency provided by robots in various leading companies. Although logistics robots are not widely applied to the entire logistics site in Korea, it is expected that work efficiency improvement will be achieved in detail as more companies are introducing logistics robots by proving their achievements little by little.

The robotics industry is moving away from the general-purpose robot level of simple repetitive tasks to the era of intelligent robots that think and act just like humans. Intelligent robots are called advanced technologies that have integrated all human technologies developed so far and have emerged as the largest market in the 21st century. The economic ripple effects derived from them are also enormous. Therefore, as the robotics industry is drawing attention, it is focusing on cultivating creative talents in robotics around the world.

Robotics Industry Emerging as a New National Competitiveness

The International Federation of Robotics (IFR) released an analysis, Top 5 Robot Trends: 2022, which includes, “Artificial intelligence (AI) for robots is maturing and robots that learn data are becoming mainstream. These robots have passed the testing stage and are now expected to be distributed more widely in 2022.”



IFR International Federation of Robotics

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Top 5 Roboter-Trends 2022

International Federation of Robotics berichtet

Frankfurt, 16. Februar 2022 – **Mit rund drei Millionen Einheiten hat der weltweite Bestand an Industrie-Robotern einen neuen Rekord erreicht – das durchschnittliche jährliche Wachstum lag bei 13 % (2015 - 2020). Die International Federation of Robotics hat die 5 wichtigsten Trends, die die Robotik im Jahr 2022 und darüber hinaus weltweit prägen, unter die Lupe genommen.**

„Der Einsatz von Robotern nimmt sowohl in traditionellen als auch ganz neuen Branchen zügig an Fahrt auf", sagt Milton Guerry, Präsident der International Federation of Robotics. „Immer mehr Unternehmen erkennen die zahlreichen Vorteile, die Robotik und Automation für ihr Geschäft bieten."

1 - Roboter in neuen Einsatzfeldern

Die Automatisierung mit Robotern erreicht inzwischen relativ neue Einsatzbereiche. Ein sich wandelndes Konsumverhalten steigert die Nachfrage nach personalisierten Produkten und Lieferungen, dem die Unternehmen versuchen gerecht zu werden. Insbesondere im Onlinehandel löste die Pandemie eine Revolution und einen Nachfrageboom aus und der eCommerce dürfte auch 2022 weiter zulegen. Weltweit sind heute in diesem Segment Tausende von Robotern im Einsatz, an die vor fünf Jahren noch nicht zu denken war.

Um dem Arbeitskräftemangel entgegenzuwirken, setzen sich jetzt auch solche Unternehmen mit Automatisierung auseinander, die das bisher noch nicht getan hatten. Insbesondere Betriebe, die auf Servicekräfte angewiesen sind - beispielsweise in der Gastronomie und im Einzelhandel - können offene Stellen immer häufiger nicht besetzen. Wir gehen davon aus, dass diese Branchen verstärkt in Automatisierung investieren, um die Anforderungen ihrer Kunden zu erfüllen. Relativ neue Kundenbranchen der Robotik wie Liefer- und Logistikunternehmen, das Baugewerbe, die Landwirtschaft und viele andere mehr profitieren ganz besonders von der täglich sich weiterentwickelnden Technologie.

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▲Source: Top5 Robot Trends 2022, International Federation of Robotics▲

Due to COVID-19, robots have increased exponentially around the world and have been applied to various industries. As problems such as a shortage of labor increase, robot automation is expected to be introduced in relatively new fields such as delivery, logistics, construction, and agriculture.

The main factors driving the spread of this introduction are easier robot manipulation and lower cost. In addition, as the number of robotics specialists increases due to policy support for robotics education, it is becoming a reason why companies are considering introducing robotics. Therefore, governments and companies in each country recognize the importance for basic robotics and automation education in the early stages for the next generation.

Current Status of Global Robotics Education Policies and Systems

We will examine the current status of robotics-related policies, education, and qualification systems in the United States, Europe, and major Asian countries that are currently focusing on the growth of the robotics industry.

<Japan>

In Japan, there is an urgent need to foster human resources capable of using robots in the area of automation of production lines with the goal of improving productivity and solving social problems such as low birth rate, aging society, manpower shortage, and the need for refoirm in working patterns. Against this backdrop, education is required that considers the needs of the educational field and necessary skills at the production site. In addition, talent in the engineering fields from educational institutions such as technical and industrial high schools and universities should be able to be placed in the field immediately after employment.

Robotics education in Japan is a situation in which robot manufacturers are responding individually. In order to immediately develop electrical power talent, it is necessary for educational institutions to develop and institute a consistent educational system and a robotics education system.

Accordingly, the Ministry of Economy, Trade, and Industry of Japan commissioned NTT Data to "investigate robot-related technologies and robot use and education status, and Japan’s teaching materials and curriculum development" and has published a report as a result.

NTT Data conducted research on the status of robotics and robotic systems integration (SI) technology education in the United States, Europe (UK, Germany, France), and Asia (China, India, Singapore, Vietnam, Thailand), and organized basic information for robotics textbook and curriculum formulation.

<U.S.A.>

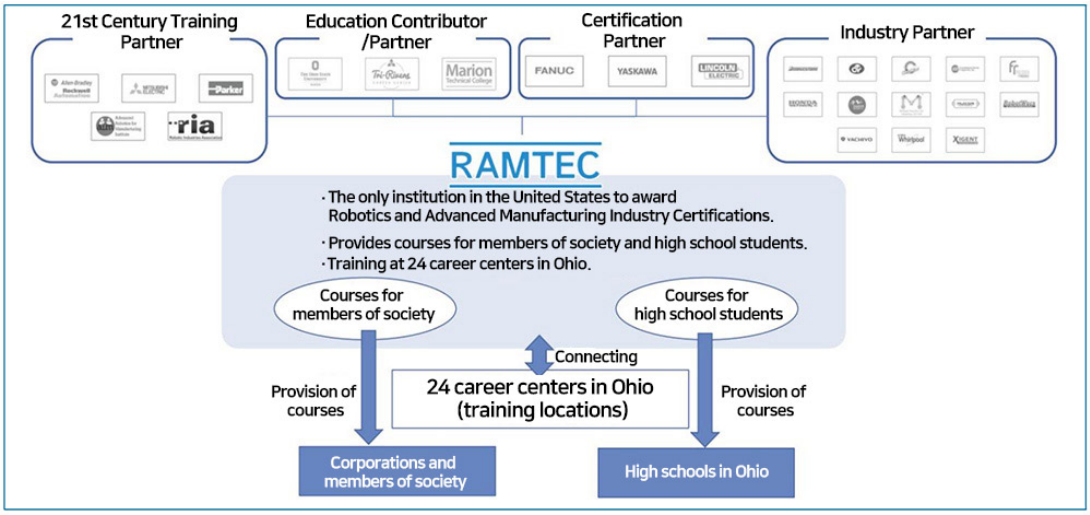
In June 2011, the U.S. government announced the National Robotics Initiative (NRI) to actively support the development and commercialization of new technologies. Initially, the U.S. Department of Defense focused on the development of military robots, particularly unmanned aerial vehicles (UAVs) and unmanned ground vehicles (UGVs). Later, the field of utilization diversified as private companies expanded their dual-use technology and promoted robots in agriculture.

In the government budget, the scale of investment specifically targeted for robots is small compared to the budget related to STEM (science, technology, engineering, and mathematics) education, but considering the undisclosed budget for R&D for military robotics, expenditures are expected to be higher.

The U.S. Robotics Roadmap 2016 revealed the five-,ten-, and fifteen-year visions and R&D roadmaps for markets, technologies, and government policies in four fields: autonomous vehicles, industrial robots, medical/nursing robots, and drones. Among them, industrial robots were presented with priorities such as skillful operation close to that of humans, nano-manufacturing, and intrinsically safe robots that work with humans, and related visions of 5, 10, and 15 years.

Education at the private and corporate level is also being actively conducted. The American Robotic Industries Association (RIA) has awarded robot integration programs and program certificates, and is actively responding to the need for cultivating highly skilled human resources, and the RAMTEC training center in Ohio is a leading U.S. robotics education institution, providing eight robotics enterprise courses for members of society and three courses for high school students.

[Organization of RAMTEX]



▲Source: Current Status and Implications of Global Robot Education Policy System. Korea Institute for Robot Industry Advancement.▲

In addition, there are two levels of certification, basic and advanced, issued by the American Welding Society (AWS), a non-profit organization, the Certification Program for Robotic Arc Welding - Operators and Technicians, and the Automated Vision+Imaging Association (AIA) and Intelitek in the U.S. are actively supporting the development of new robotics technologies by providing technical education programs and teaching materials for production devices to middle schools, high schools, universities, and vocational training schools.

<Europe>

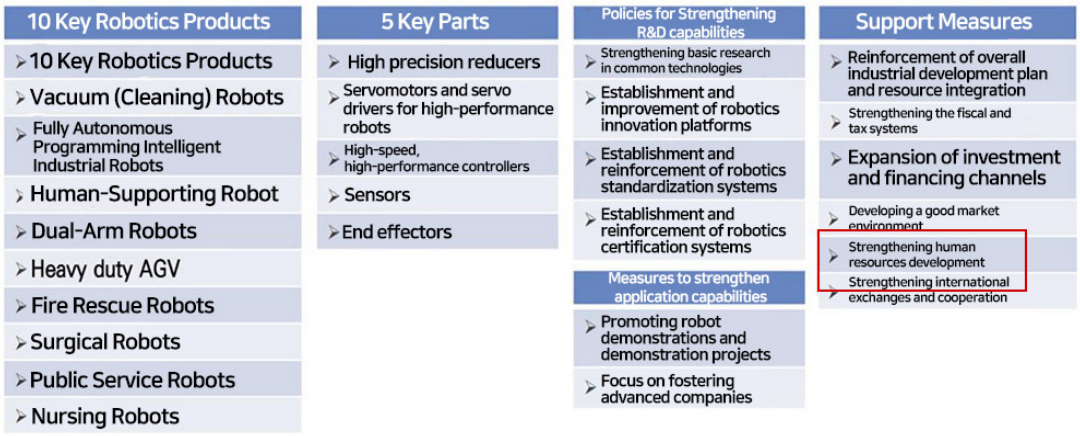
In Europe, robotics education is being led by private organizations and companies rather than by the state. Germany, the headquarters of the global robotics company KUKA, has introduced a different education system from that of other countries, and the Chamber of Commerce and Industry standardizes basic learning and provides education that reflects the needs of the industry. Many companies that cannot provide training in-house have abundant training professionals and training tools. They send their employees to KUKA, entrusting KUKA with their basic technical training, which includes actual factory training. This educational system plays a very important role in supporting the German industry. KUKA trains vocational training school students in its own company, and all those working in assembly factories play a role in supporting the German industry by completing their training at KUKA.

<Asia>

China and India are characterized by state-led policy implementation, and in Singapore, Vietnam, and Thailand, the robotics industry is regarded as a core industry and the training of related human resources is being promoted as a task of major importance.

In particular, in China, based on a report by Manufacturing Powerhouse Strategy Research, the Ministry of Industry and Information Technology has been coordinating with 20 government agencies, including the National Development and Reform Commission, the Ministry of Science and Technology, the Ministry of Finance, and the China Institute of Technology, since 2014 to cooperate with the manufacturing industry. A long-term strategic plan for promotion was established, and in April 2016, the Robotics Industry Development Plan (2016—2020), jointly announced by the Ministry of Industry and Reform of China, the National Development and Reform Commission, and the Ministry of Finance, included robotics-related departments in universities for systematic human resource development. Departments were opened and vocational training measures related to employment support were included. The Chinese government is promoting robot SI education in accordance with "Made in China 2025," and the fact that most of the government is involved, as in reorganizing robot-related qualifications, is a difference from the US and Europe, where the private sector is the focus.

[Overview of the Robotics Industry Development Plan (2016—2020)]



▲Source: Current Status and Implications of Global Robotics Education Policy System. Korea Institute for Robot Industry Advancement.▲

Implications According to the Current Status of Global Robotics Education

Countries that are involved in robotics education led by the government have recently seen a significant increase in the number of robotic operations compared to other countries surveyed, while countries that promote private-led robotics education such as the United States and the United Kingdom tend to be relatively mature.

In particular, it was found that the United States is preparing a variety of systems, such as qualifications, training, educational institutions, and industrial robot competitions. In China and India, the number of robots in operation has increased, thanks to government-led policies and economic growth. It has been confirmed that countries such as Germany and Singapore are aware of the structural transformation of the manufacturing industry through ICT development and changes in the skills required for workers, and are making policy efforts such as including robotics in job-seekers, vocational training programs.

[Industrial robot operation growth rate]

순위	국가	2015	2016	2017	2018	CAGR
1	Viet Nam	2,455	4,059	12,234	13,782	77.7%
2	China	256,463	349,470	501,185	649,447	36.3%
3	Singapore	9,301	11,666	15,801	19,858	28.8%
4	India	13,768	16,026	19,000	22,935	18.5%
5	Thailand	26,293	28,182	30,110	32,331	7.1%
6	U.S.A.	234,245	250,479	262,058	285,014	6.8%
7	France	32,161	33,384	35,321	38,079	5.8%
8	United Kingdom	17,469	18,471	19,488	20,683	5.8%
9	Germany	182,632	189,270	200,497	215,795	5.7%
10	Japan	286,554	287,323	297,215	318,110	3.5%

▲Source: Current Status and Implications of Global Robotics Education Policy System. Korea Institute for Robot Industry Advancement.▲

The Present and the Future of Robotics Education in Korea

In Korea, the Ministry of Trade, Industry, and Energy is leading the training of robotocs and AI convergence-type talent as an independent or cross-ministerial project. In 2019, manufacturing robots were introduced jointly by the Ministry of Education and the Ministry of SMEs and Startups through the Third Basic Intelligent Robot Plan in 2019, and measures such as expansion of corporate-centered employee education and training database handling education and training, etc. are underway. In addition, intelligent robots were selected as one of the three new areas of the AI Convergence Industrial Field Technologists Innovation Competency Reinforcement Project, and from 2020 to 2024, a total of 29.5 billion KRW was invested in Gumi, with a total of 14.4 billion KRW from the government and 15.1 billion from KRW the local government. It plans to build a Robotics Occupational Innovation Center to train more than 700 robotics operators and coordinators annually.

However, Korea is suffering from a high dependence on foreign robots, a shortage of SI companies, and a shortage of specialized manpower for using robots. Therefore, it is necessary to establish a roadmap for cultivating talent robotics to revitalize domestic robotics and system convergence (SI). Korea Association of Robot Industry (KARI) survey results: As of 2018, analysis revealed that there was a manpower shortage of 853 individuals for the use of robots in manufacturing, and the annual shortage rate was 7%.

For the development of Korea's robotics industry, operators and coordinators focused on domestic robotics are needed, and a industry-university cooperation system should be established to strengthen education centered on domestic robotics and domestic facilities.

Sources

- [Robotics Industry Policy Trend May 2022] Current Status and Implications of the Global Robotics Education Policy. Korea Institute for Robot Industry Advancement.
- Top 5 Robotics Trends for 2022. International Federation of Robotics.

People in ICT

Elder Choi Won-seok Reveals His Bold Ambition to Become a “Noble Man”!

Interview | Choi Won-seok, InfoU & Company

Mixed reality lies between reality and virtual reality. It creates a new environment or information within real time. Our technology has developed day by day, expanding its scope to medical care, sports, and education. Now the metaverse is no longer just a dream.

Elder Choi Won-seok wants to be remembered as the best employee just like in the famous line “You’re noble! You are a noble person, a noble!” from the movie “Along with the Gods.” He is now working at InfoU and Company, and is thinking about marketing strategy for mixed reality, and in addition, to the goal of customer satisfaction and industry revitalization. His endless challenge will continue. Let’s meet Choi Won-seok, a senior member of InfoU and Company, and hear his passionate story.

Q

Hello, please introduce yourself to our readers.

A: Hello, my name is Choi Won-seok, data and big data analyst in the Future Strategy Group at InfoU and Company. I think it's been about a year since I moved to this company after previously working for a large company. I am still working hard to learn many things

Q

What are you currently in charge of in your company?

A: I am in charge of admin and marketing work. I am still worrying a lot about marketing, because there are many customers who are still unfamiliar with mixed reality, so I'm going to introduce that today.

Q

I know you are collaborating with Microsoft. What kind of business do you collaborate on?

A: InfoU and Company acquired Microsoft's HoloLens-related technical qualifications, MRPP (Mixed Reality Partner Program) and DMP (mixed reality distributor-managed partner) licenses, as well as big data-based data analysis business, to sell Microsoft's HoloLens 2 equipment and mixed reality solutions. There are only three Microsoft-certified companies in Korea, so I feel proud of that. [Laughs]

▲Hololens 2, Source : InfoU & Company▲

Q

What is the secret to being able to collaborate with a large global company?

A: We, InfoU and Company, have always shown a desire to continuously improve the services provided to our customers. Therefore, we have been able to develop and service our own solutions, Brain Portal and Meta Solutions, That's why I think we are able to work closely with Microsoft.

Q

Were you interested in the metaverse?

A: First of all, "metaverse" is being mentioned as a hot buzzword in many industries. Therefore, each sector defines the metaverse and creates business, producing so many different viewpoints. For example, there are various "viewpoints" that look at the metaverse from industrial aspects such as the gaming industry and general communication companies. Since my duties are to identify and analyze trends in the above areas and create services, I can say that I am interested in the metaverse.

Q

Could you tell us the top 3 thing that your company takes pride in?

A: We, InfoU & Company, are collaborating with Microsoft for the HoloLens business by acquiring the MRPP silver license for the first time in Korea. In addition, starting with the release of MetaCall, mixed reality's own solution; Meta-Meeting, Metaflow, and META Solutions are being released and ready for service.

The META Solutions is designed to provide the best user experience in the mixed reality environment using WebRTC and Spectator View libraries, and it can be widely used in the manufacturing industry as well as in launching mixed reality education platforms.

Q

What kind of employee are you in the company?

A: Our company is oriented toward horizontal relationships. I handle tasks from various angles, such as taking the initiative as a project leader and sometimes working collaboratively like a real newbie. I was very impressed after watching the movie Along with the Gods." In the movie, there is the saying "You're noble! You are a noble person, a noble!" Similarly, I hope you will also remember me as a top-notch employee. (Laughs)

Q

What are your strengths and weaknesses?

A: There can be strengths and sometimes otherwise, but I don't give it a lot of thought. I have experienced a lot of difficult times in caring about work or relationships with others. So, I am usually not worried too much about what people say.

Q

What is the most memorable work-related thing you have done?

A: In addition to HoloLens 2 products and metaverse solutions, our company also provides MR training to customers. Once, I went out to ptovide support to a financial company's MR training. Working with Microsoft, I remember meeting so many customers who would actually use HoloLens products in person and listening closely to their opinions.

Q

How did you prepare for employment?

A: I prepared mainly for the job interview. There are so many great people in the document field these days, so I thought I should be preparing for a job by focusing on how to actually make the contents of documents appealing. I think it's really important to be able to present yourself calmly without getting too excited.

Q

What do you need most while working for a company?

A: I wish there were more colleagues to co-work with. This is because there is nothing more reliable than members of the same team when you're having a hard time at work.

Q

What do you usually do to relieve stress after work?

A: After work, I usually hit the gym to do cardio. I think this is common among office workers. If you don't have basic physical strength, it may be difficult to work in the long term. So, I tend to focus on managing my stamina.

Q

What are your future goals?

A: In addition to mixed reality, InfoU and Company is also conducting big data and data analysis projects. I want to become the best administrator and marketer in Korea, not only in mixed reality but also in the big data and data analysis business.

Q

Any messages for our ICT Industry Hot Clips readers?

A: It would be nice if we approach the metaverse from an industrial point of view with a bit more expandability rather than just as a buzzword. For example, as the aspect that creates economic value in games or virtual reality. The metaverse is not a fictional story but can be adapted to present reality. If you focus on the concept without becoming too buried in the meaning of "metaverse," I think the metaverse will definitely create good opportunities.

SIDUS LOCUS

LOCUS CO

☑ GENERAL INFORMATION

- **Name of dedicated agency**
  National IT Promotion Agency
- **Detailed project name**
  Digital content firm's competitiveness consolidation

☑ COMPANY INFORMATION

- **CEO**
  Kim Beom-hyu
- **Type of business**
  Advertisement, movie, and video production
- **Year of Establishment**
  2009
- **Homepage**
  http://locus.com/

☑ KEY ACHIEVEMENTS

Produced metaverse content "I Met You 3" using virtual human and machine learning technology.

Produced digital human docent media art exhibition contents using real-time rendering technology (completed delivery to Samsung Electronics and Cheil Worldwide).

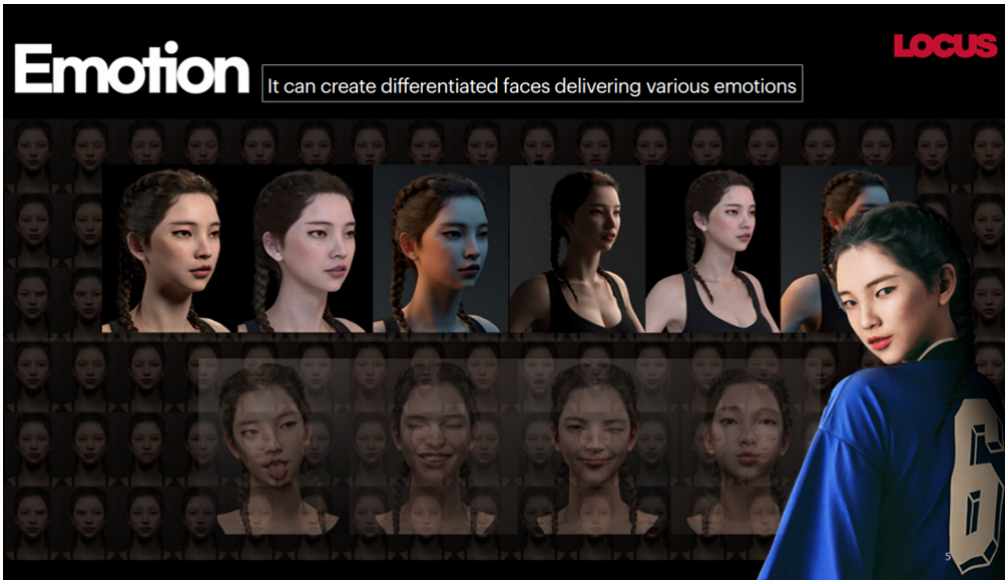
Propelled artworks NFT content service in collaboration with Seoul Auction and Upbit.

Locus's Own Technological Competence Taking Pride in the World's Best

Leading the Korean XR and metaverse markets including NFT based on excellent CG/VFX production capabilities in motion picture/video content, Locus Corporation was established in 2005, building up achievements and taking pride in the highest technological competence and completeness in the domestic computer graphics field. Locus is a matchless company boasting of high technological competence in producing Rozy who debuted as a virtual musician, including the movie "Parasite" and the animation "Yumi's Cell."

The reason Locus can produce high-level computer graphics is that the company has its own technological competence and database. Locus has a technology completing photogrammetry solutions such as facial photo scan pipeline using 74 units of DSLR. Therefore, the company constructs a 3D photo scanning technology producing high match rate and low noise and FACS data and embodies perfect 3D configuration through R&D and pipeline solutions using facial scanning technology. By constructing real-time rendering workflow and 51 FACS lists for 3D character creation, Locus is producing the world's top-class computer graphics by newly constructing the existing list (Western people's action unit) into an action unit applicable to Oriental people's characters.

Arts and Technology of Computer Graphics that Made Digital Human



Locus Corporation is challenging itself anew through production of contents in diverse areas based on videos. The company shows good performance in all content areas where computer graphics are applied ranging from movies, dramas, and documentaries to animations, advertisements, games, and interactive new media. Locus produced Red Shoes, a global feature animation nominated for an Academy Award, and SBS Running Man as well as the drama Yumi's Cells. Through the digital human Rozy based on its own technological competence, Locus's computer graphics production technological competence was recognized; thus serving as a successful example of the commercialization of digital human.

Demonstrating good performance in the new media area, Locus has produced over 4,000 ads using computer graphics technology including Samsung and LG; thus, Locus is distinguishing itself as a computer graphics company with the highest completeness in Korea.

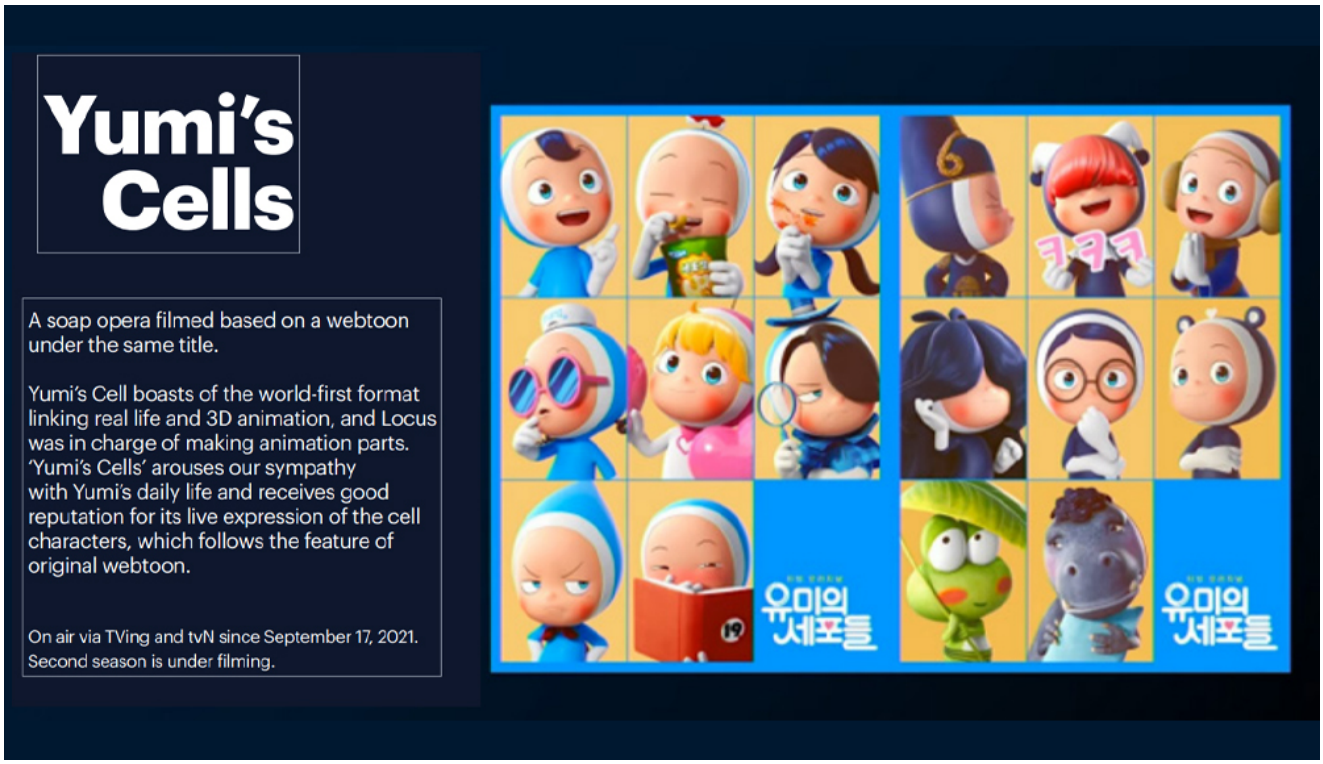
Dreaming of Connection between Reality and Virtual World

If a virtual world is made through computer graphics and digital human business, Locus has created another world of experience through the production of immersive contents by fusing with reality. The company embodied the following: an unforgettable memory to someone in "Mother's Flower Garden" of I Met You, an MBC VR human documentary. Deep impression, memory, and experience of viewers by embodying the fire scene's experiences that cannot be experienced in reality with vivid computer graphics were presented in "I Met a Firefighter." Thus, a taste of the future of immersive content technology could be had.

Locus's challenge of immersive content does not end here. The company produced a 3D virtual simulation that disguised a real action and provided a solution that helps in the training of the police. In the mock training solution produced by Locus, the user can experience diverse incidents in everyday life sites as if enjoying in a first-person view game via 3D virtual simulation. As an instructor presents an outbreak situation during the training depending on the situation, the trainees' training performance is improved. The demonstration of KNPA and Police Human Resources Development Institute is scheduled, so it is expected to be used as a full-swing 3D virtual solution soon.

Having made new experiences through new media video content, digital human, and immersive content production, Locus connects the reality and the virtual world in more areas via digital experience. The company is also continuously challenging new business areas wherein consumers can create the second and third contents and experience them.

ICT Fund that Enabled Preemptive Challenges



The ICT Fund was the background wherein the challenges of Locus can continue in order to achieve something. As a leading Korean computer graphics company, Locus said they participated in the ICT Fund project to perform challenging projects preemptively, vitalize the industry, leave a good example, and help the media content market.

Locus accomplished another feat recently. The company could expand its business area through participation in the ICT Fund project, as Locus was included as a subsidiary of Naver Webtoon; therefore, the company could diversify its content business using powerful IP. Locus plans to fulfill its mission as a leading and exemplary company in the industry through active challenges.

TIME LINE

2009.

Established Locus Corporation

2012.

Produced Yeosu EXPO Korean Pavilion exhibition videos

2016.

Produced Kazakhstan’s EXPO Theme Pavilion and Korean Pavilion exhibition videos

2017.

Produced Pyeongchang Olympics PR contents

2019.

Red Shoes was awarded the President’s Prize at the Korea Content Awards in the animation category

2020.

Launched Korea’s first virtual influencer Rozy (with Sidus Studio X)

2021.

Produced the tvN drama “Yumi’s Cells” computer graphics and animation

Won the Science and ICT Minister’s Prize

Received the Korean National Police Agency Commissioner's Order of Merit

2022.

Received the Economy and Finance Minister’s Prize

Kofpi 한국임업진흥원 Korea Forestry Promotion Institute

KOREA FORESTRY PROMOTION INSTITUTE.

☑ GENERAL INFORMATION

- **Name of dedicated agency**

  National Information Society Agency
- **Detailed project name**

  Construction of big data platform and network

☑ COMPANY INFORMATION

- **CEO**

  Lee Gang-oh
- **Type of business**

  Public institution affiliated with the Korea Forest Service
- **Year of Establishment**

  2012
- **Homepage**

  https://www.kofpi.or.kr/index.do

☑ KEY ACHIEVEMENTS

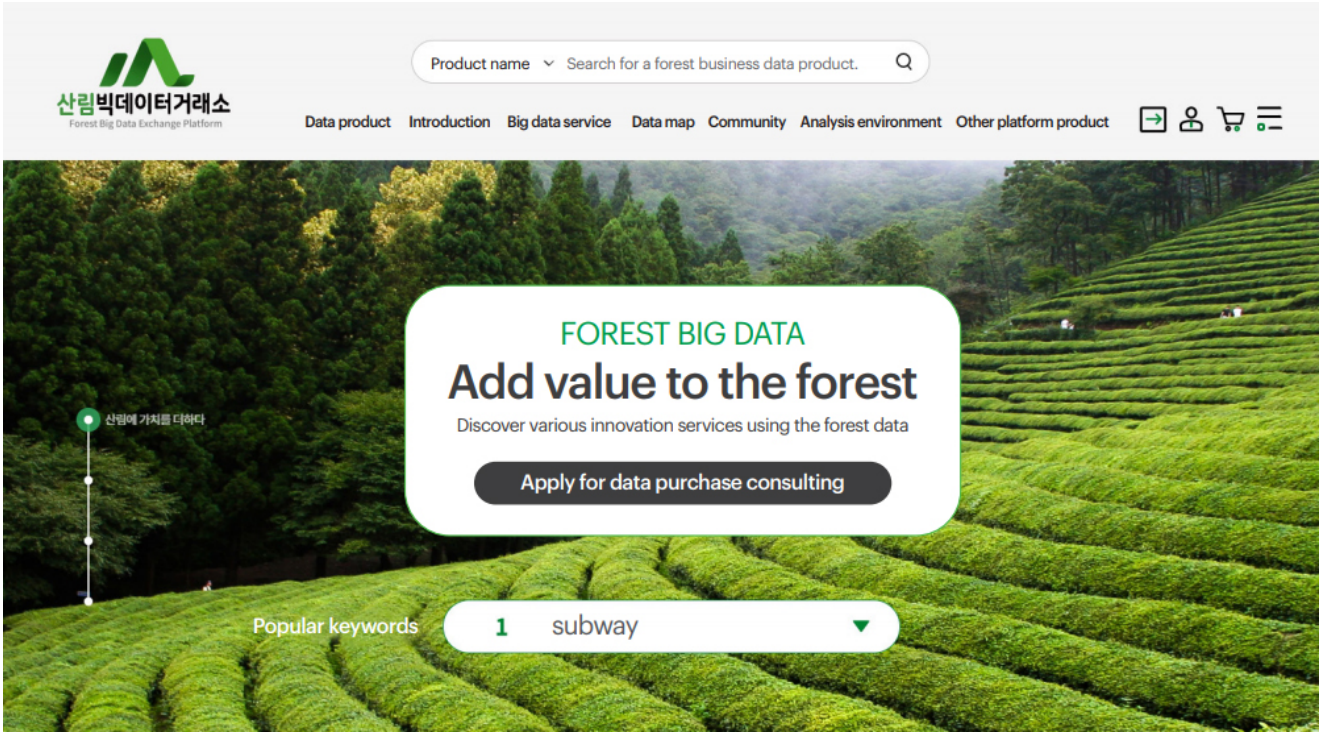
Invigorated customer-tailored data production and distribution through demand analysis

Science and ICT Minister's Commendation in the data opening and distribution invigoration category (2021)

Launched Big Square Union, a federation of the five sectors: forestry, environment, distribution and consumption, transportation, and agri-food

Possibility of the Forest Industry Awakened by the Forest Big Data Platform

Korea is a leading country in the reforestation field. Although Korea succeeded in reforestation for the short-term, the forest industry is in a very poor situation, taking up less than 1% of the total GDP. Difficulties lie in increasing production capacity and resolving the relevant problems using forest data due to inactivation in the data market, low use of data, and public sector-centered data construction in the forest field.



To resolve these issues, there is a need to discover clean forest business using forest data; enhance forest value with collaboration with other fields; and combine forest with diverse fields, using as a future driving force. This is because the construction and operation of the forest big data platform is urgent.

The Korea Forestry Promotion Institute (KOFPI) is an appropriate institution, and has constructed a data dam by integrating and loading private sector data in the forest field through the ICT Fund project. KOFPI is leading in resolving diverse social problems using the forest data through data opening and distribution, data-using business discovery, and mash-up service with other fields.

An opportunity of the forest industry's digital transformation – forest big data platform and center construction

The forest big data platform started as an idea of several people. A self-deprecating concern has existed among people engaged in the forest industry: "Can innovation be carried out in the forest field?" "What value can be created from the forest?" The platform construction has become possible through collaboration with people in diverse fields, and the possibility has changed to conviction, as KOFPI was selected as the platform construction firm.

Difficulties existed due to the lack of data business casesdiscovery and new business development cases which stem from low forest data utilization in the ICT Fund project operation process. Different opinions and closed mindset of stakeholders posed new challenges. KOFPI made a breakthrough with innovation by setting forest business expansion and entrepreneurship dreaming of future innovation as selection criteria upon selection of participating companies in the ICT Fund project. KOFPI set firms engaged in the forest industry that can apply and fuse forest data to other industries and that can distribute data as a condition of participating firms.

KOFPI tried to offer a new stimulus rather than common idea to participating companies in the ICT Fund project; however, there were a lot of trial and error in the process. But all these helped the people behind the project to form an indomitable will to overcome and improve, and KOFPI has made good achievements each year. The participating firms create new values through the ICT Fund project, discovering future growth engines through expansion of business fields and continuously growing.

Operation of Living Lab for Fusion and Collaboration with Other Industries and Social Problems Solving

The biggest characteristics of KOFPI's ICT Fund project can be itsfusion and collaboration with other industries. Since forest has high linkage with other fields, diverse types of collaboration are possible. This can be an advantage in using forest data and business discovery; thus,KOFPI is operating Living Lab that expands forest fields, discovers forest field's social agenda, and quickly appliesthem through fusion between forest data, fusion with other industries, and collaboration governance such as BigSQuare Union.

KOFPI plans to expand its network with other industry fields via PR of best practices through data performance report and World Forestry Conference (WFC) by reinforcing cooperation base. KOFPI is also going to consolidate a data use system by establishing data-based forest administration policy and measuring the performance, as well as discovery of high-tech companies and technological innovation such as big data and artificial intelligence (AI). KOFPI is willing to contribute to forest science and technology development by providing the data production and analysis environment for forest science and technology R&D.

TIME LINE

2012. 01. 26.

Opened Korea Forestry Promotion Agency

2013. 08. 12.

Designated as an internationally-recognized testing institution (KOLAS)

2016. 03. 02.

Opened Pine Wilt Disease Monitoring Center

2016. 07. 30.

Opened Forest Carbon Center

2017. 01. 23.

Designated as a forest science and technology research management institution by the Korea Forest Service

2019. 01. 31.

Opened Forest Big Data Exchange Platform

2020. 03. 30.

Designated Mountain Village Activation Support Center by the Korea Forest Service

Code Reach

CODE REACH CO., LTD.

☑ GENERAL INFORMATION

- **Name of dedicated agency**

  National IT Industry Promotion Agency
- **Detailed project name**

  Digital content firm's competitiveness consolidation

☑ COMPANY INFORMATION

- **CEO**

  Eun Gwang-ha
- **Type of business**

  Software R&D and supply, multimedia learning devices manufacturing, development, and supply
- **Year of Establishment**

  2017. 02.
- **Homepage**

  http://www.codereach.co.kr/site/index.php

☑ KEY ACHIEVEMENTS

Developed key sensor technology used for VR sports based on image sensing technology (Patent owned).

Obtained and supplied sensor technology and content by developing technological capabilities.

Launched the VR sports solution “T-coach.”

Technology to Enjoy Various Sports with One Sensor

Code Reach is a system enabling various ball game sports' training and activities indoors—which is not affected by the external environment—with one sensor in terms of outdoor sports activities. Code Reach Co., Ltd. developed a VR sports model shaping a safe, pleasant indoor sports environment and leading the Fourth Industrial Revolution era with the harmony of fun and sports.

The company is supplying the VR sports room to facilities requiring physical activities (sports) nationwide. Code Reach analyzes and provides 10 types of data that can be revealed when a player makes hits or kicks, and the data can be viewed through top and side video footage playback. Thanks to the source technology enabling self-coaching such as posture correction, the company has maximized utilization by developing sports contents using the technology.

Through the Nationwide Elementary VR Sports Room Diffusion project organized by the Ministry of Culture, Sports, and Tourism and Korea Sports Promotion Foundation, Code Reach is focusing on its solution market expansion; it has a technology enabling enjoying various sports with the only sensor in Korea. Consequently, Code Reach carried out hardware simulator production and content development to prove the excellence of Code Reach's sensor technology. It has enhanced compatibility and boasts of market competitiveness through cost savings.

Expansion of the Contactless Home Training Market

Having participated in the ICT Fund project, Code Reach is developing contactless home training content using its source technology. It has developed a solution to measure and evaluate users' exercise results without time and place restrictions. Specifically, the company developed indoor training exercise content-based solution Smart Coach, and it could measure the users' safe indoor exercise results as initial-stage exercise data. Through this, a function of providing continuous exercise guide could be added.

Contactless home training can guide exercise suitable for each person, and there were many difficulties in setting a guideline for different exercise abilities by age. However, Code Reach has obtained data through various demonstration tests including football clubs, theme parks, and child development centers and has developed an exercise curriculum suitable for people from all walks of life based on it.

Preparing a Bridge to Expand New Markets

Through the project, the development of four types of training and measuring contents was completed, and Code Reach additionally developed two types of contents depending on the market requirements and got to discover nine customer firms. Above all, through demonstrations on the elementary school class utilization, linkage was made with elementary school virtual sports room, and the foundation for supply was established. Consequently, the company recorded higher sales than the target in the business plan.

Through the project, Code Reach seized an opportunity to access the training content market in the sports simulator-centered business and established a bridge to expand new sales partners and markets. Based on the project performance, Code Reach employed new capable developers to reflect feedback actively to the functions and requirements of markets, and the project has become an opportunity for demonstrating the development team's capabilities.

New Business Applied with AI Solution

Code Reach plans to accelerate for better performance in the future using the contactless exercise technology. Aside from the home training service, the company aims to create new markets through contribution to sales via continuous commercialization by fostering the derivative content industry in the sports, games, medical service, and silver industry areas.

Code Reach will continue to grow with a core value to create a sports environment enjoyed by the whole family in a safe, pleasant environment. An opportunity for win-win partnership with firms developing the technologies in line with the value pursued by Code Reach is expected.

TIME LINE

2017. 02.

Established Code Reach established

2018. 11.

T-coach (VR sports device) acquired K Mark certification

2018. 12.

Launched T-coach (VR sports room solution)

2019. 01.

Awarded a prize at the 12th Korea Excellent Patent Exhibition

2019. 06.

Registered multi-sports sensing system patent

2019. 07.

Set piece simulation system and simulation-offering method patent registered

2019. 10.

Registered screen baseball system and screen baseball offering method patent

2019. 11.

Launched T-coach 2

2020. 11.

Selected as KIPO Commissioner’s excellent invention by the Korea Invention Promotion Association

2021. 08.

Installed the VR sports room integrated platform

ASTRON SECURITY

ASTRON SECURITY CO., LTD.

☑GENERAL INFORMATION

- **Name of dedicated agency**

  Korea Internet & Security Agency
- **Detailed project name**

  Shaping the global ICT innovation cluster

☑ COMPANY INFORMATION

- **CEO**

  Cho Geun-seok
- **Type of business**

  Service/Software development and supply
- **Year of Establishment**

  2019. 03.
- **Homepage**

  http://www.astronsec.com/

☑ KEY ACHIEVEMENTS

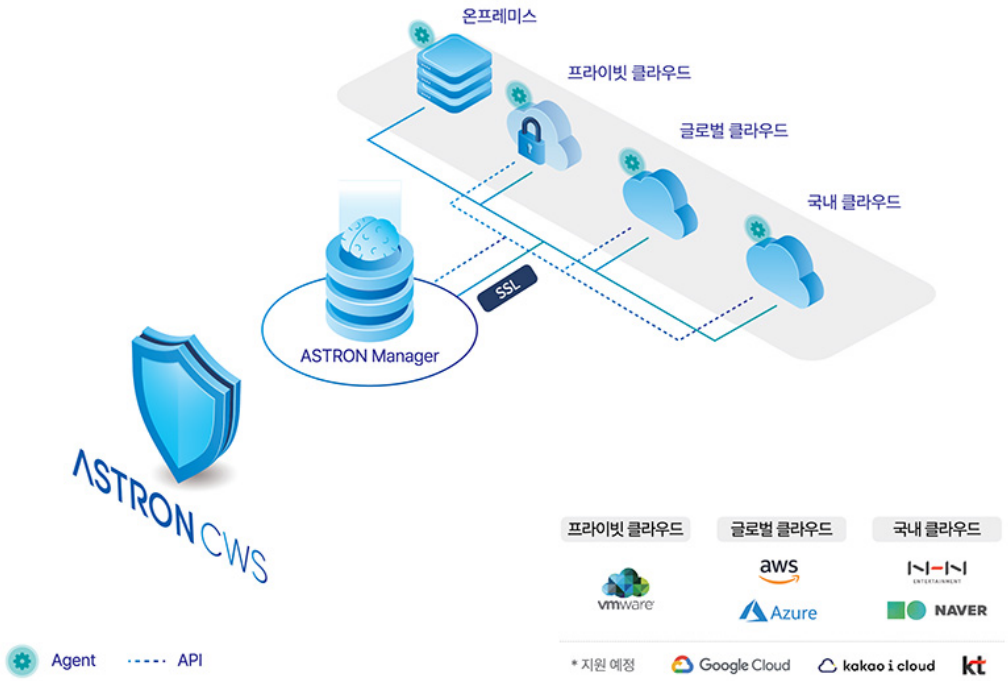
Commercialized Astron-CWS product.

Registered on the PPS Nara Market Place General Shopping Mall with GS Certification Grade 1

Attracted Seed Free-A and A Series investment (cumulative KRW 8 billion).

Achieving Technological Advancement through KRW 8 Billion Invested Money

As a security expert solution company protecting cloud infrastructure, Astron Security is growing into a model company by receiving various government subsidies such as KIBO and TIPS starting with KISED in 2019. With the boost from Korea Technology Finance Corporation's support, Astron Security attracted cumulative investment of KRW 8 billion in 2021. As such, 28 developers can devote themselves to R&D for product advancement.



Concerns on IT security are emerging in the market, and demand for security technology is projected to increase steadily because a clear security solution has yet to be developed. Astron Security has succeeded in the commercialization of innovative workload- based technology from its existing security system to develop high-level security solutions. The cloud API and security agent-combined solution developed by the company for the first time ever in Korea is receiving good responses in the market, and Astron Security is gradually implementing its ambitious plan to enter the global markets.

Successfully Securing Research Personnel through the ICT Fund

Astron Security strives for further security solution development through participation in the ICT Fund project. The company could detect abnormal activities in real time and carry out the modeling required by applying the technology to the AI-based cloud security solution. Astron Security developed important patterns of account monitoring by analyzing massive amounts of data received through the linkage of API from Amazon AWAS and Microsoft Azure. In addition, Astron Security could lay the foundation for its own algorithm commercialization through the internal verification of test bed and external certification institution.

Astron Security's outstanding competitiveness lies in the fact that the company has far more excellent research personnel compared to competitors. Based on the rich knowledge and experience of an executive with more than 20 years' work experience and team leaders with over 10 years' work experience in the IT security solutions, the company was able to realize remarkable achievements in one year from product development to commercialization. Astron Security could lead product advancement by placing human resources that can quickly adapt to the technology change speed through the ICT Fund.

ICT Fund Becoming a Valuable Ingredient to Startups

Astron Security showed good performance using the ICT Fund project to reduce the burden of wage from employment. Focusing on R&D, Astron Security had to employ highly qualified personnel, but there was a limitation in paying appropriate annual salary as an SMB. Therefore the ICT Fund was input to salary payment preferentially. Consequently, the company could grow with steady performance by employing the necessary personnel. The ICT Fund project can be an ingredient for the survival and continuous growth of SMBs especially startups. Thus, the ICT Fund is judged to play a pivotal role in overcoming a crisis such as Death Valley or Trough of Sorrow someday.

Astron Security set the development of AI/ML-based cloud security as its foremost goal. The company entered into active business operations to cope with the future such as setting up Cloud AI Lab within the company and reinforcing team members. The Korean cloud market is expected to be valued at KRW 11.6 trillion in 2025, and the cloud security market is forecast to increase steeply to KRW 2.5 trillion in 2025.Astron Security is striving to develop the Korean cloud technology remarkably through product advancement.

TIME LINE

2019. 03.

Established Astron Security Co., Ltd. on March 26, 2019

2019. 08.

Established Astron Security-affiliated research institute, Certified as a venture business

2020. 06.

Attracted seed investment from KIBO, Selected as initial startup package of the Ministry of SMEs and Startups

2020. 11.

Won first place at the K-security Startup IR Festival 2020

2021. 01.

Attracted investments from Ahn Lab and KB Investment, Signed a strategic alliance MOU for Ahn Lab-Astron Security cloud security business, Registered on the KSM(KRX Startup Market)

2021. 06.

Selected as a TIPS business

2021. 07.

Signed an MOU for strategic partnership on cloud security business between netKTI and Astron Security

2021. 11.

Attracted investments from KB Investment, Ahn Lab, KDB, Hyundai Investment Partners, Ajou IB Investment, and Lighthouse Combined Investment

2021. 12.

Startup Grand Prize at the Security Awards Korea 2021

2022. 03.

Entered into a solution partnership between T&D Soft and Astron Security