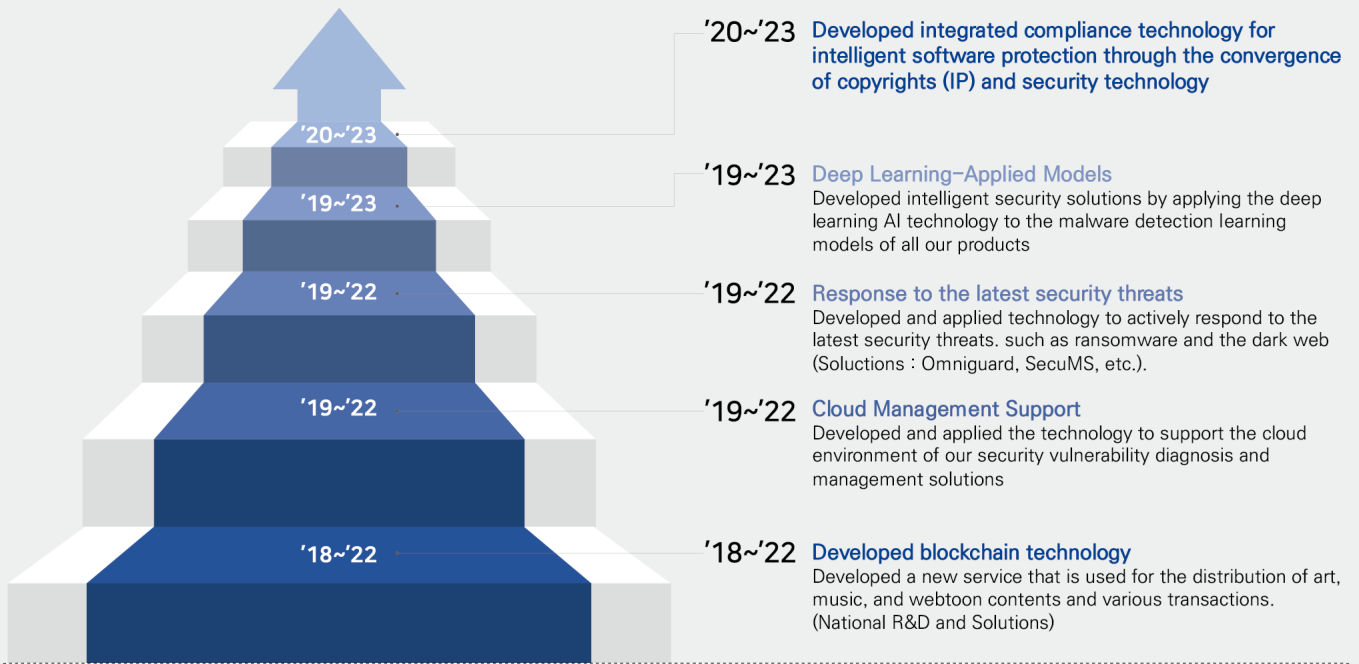# R&D (Research & Development)

LSware Inc. is vigorously striving to research and develop advanced technologies through an R&D group made up of master's and doctoral level experts in collaboration with software research institutes. The R&D group is creating a future vision of LSware Inc. by conducting various research missions, commercializing technologies and products.

'20~'23 Developed integrated compliance technology for intelligent software protection through the convergence of copyrights (IP) and security technology

'19~'23 Deep Learning-Applied Models
Developed intelligent security solutions by applying the deep learning AI technology to the malware detection learning models of all our products

'19~'22 Response to the latest security threats
Developed and applied technology to actively respond to the latest security threats. such as ransomware and the dark web (Soluctions : Omniguard, SecuMS, etc.).

'19~'22 Cloud Management Support
Developed and applied the technology to support the cloud environment of our security vulnerability diagnosis and management solutions

'18~'22 Developed blockchain technology
Developed a new service that is used for the distribution of art, music, and webtoon contents and various transactions. (National R&D and Solutions)

- Applied deep learning technology to all of the LSware's solutions and services company-wide (2019~2023)
- Developed and applied the technology to support the cloud environment of the company's security vulnerability diagnosis and management technology (2019~2022)
- Developed and applied the technology to actively respond to the latest security threats such as ransomware and the dark web (2019~2022)
- Developed blockchain technology and a new service for distributing art, music, and webtoon contents using this technology (2018~2022)
- Developed software protection integrated compliance technology through the convergence of copyrights (IP) and security technology (2020~2022)

우수 기업연구소
지정기간 : 2020.12.21~2023.12.20
엘에스웨어(주)
소프트웨어연구소
과학기술정보통신부

ECRC
우수기업연구소
과학기술정보통신부

〈 Designated as Best Practice Enterprise Research Institute by the Ministry of Science and ICT 〉

Intellectual Property Rights

49 Patents
- Patents for new technologies such as AI
- Applied for 1 patent abroad (Japan)
- SMART Index: BB or higher

Publication in Korean and international journals and academic presentations (60 cases)
- Domestic and foreign journals: 11
- Academic presentations: 49

Contributed to the TTA and international standardization (13 cases)
- Contributed to ASTAP standardization
- Proposed and developed the TTA standard

Registered IPs for SWs (77 cases)
- Registered the copyrights for the latest technological developments

Key Technology Researches

Copyrights and Content Distribution Technology
- Technology to analyze characteristics/relationships of modern paintings
- Webtoon settlement monitoring
- A platform for the settlement and distribution of copyright royalties
- AR contents service technology for Jeju tourism using drones
- Hologram copyrights protection and distribution platform

Machine Learning Technology
- Anomaly detection for electricity generation and consumption patterns
- Receipt image recognition
- Malware binary detection
- Behavior-based intrusion detection
- Technology to detect illegal crops using drones and artificial intelligence

Open Source SW Technology
- Open Source license conflict and verification automation
- OSS and license search and recommendation technologies
- SPDX (Software Package Data Exchange) based license tracking
- Non-face-to-face (online) Open Source SW license consulting system

Blockchain Technology
- The multi-channel-based parallel processing blockchain technology that guarantees minimum TPS
- Research on new copyright service model using blockchain
- Blockchain-based electricity trading and auction platform
- Supporting bank account-based transfers that do not depend on coins/tokens

Smartgrid Security Technology
- Simple password authentication technology that can be linked with PKI in a Smartgrid environment
- OpenAPI-based personal information de-identification and protection
- Elliptic curve-based authentication protocol

Network Security Technology
- Ransomware detection and recovery technology based on intelligent honeypot
- Packet analysis technology for tracking Tor/Dark Web
- SPDX-CVE based security vulnerability tracking and inspection

Key Patents on Technologies

Area	Title
Security Technology	Multinational anonymous traffic collection system to protect copyrights
	Tor Network traffic and feature points collection system using private networks and virtual machines
	Mutual authentication method in remote meter reading system including smart meter, data gathering device and authentication server
	A device that detects reconnaissance of a target account based on artificial intelligence
	A device that detects hijacking of target accounts based on user behavior analysis
	System and method for managing software vulnerabilities using SPDX technology
	System and method for secure electricity trading applying cyber kill chain technique
	Remote meter reading system and smart meter authentication method therein
	Group communications method and system
	A blockchain-based system that detects forgery and tampering of data on painting works
	Tor network traffic collection systems and methods
	Electricity trading system and method through cooperative-based auction
	The follow-up detection of the vulnerabilities of software components using SPDX technology, and the control and management features of the software including vulnerabilities
	Database management system and method therefor
	Database access control system using user terminal, and method therefor
Blockchain	Method to predict the number of closing blocks of a transaction according to key redundancy
	A method to detect a key that requests addition, change, or deletion of the ledger inside the smart contract
	A blockchain system for distribution and processing of transactions using common keyset information, and a method of their execution
	A system for classifying transactions using key information, and a method therefor
	Device and method for changing blockchain information linked to external storage (Rev 2.0)
	Blockchain-based system and method for managing energy data
	Device and method for changing blockchain information (Rev 2.0)
	Device and method for changing blockchain information
	Blockchain-based system for managing analysis information on painting works, and method therefor
	A method to analyze electricity trading data stored in the blockchain, based on a neural network
Open Source	A system for providing metadata of an open source project, and a method therefor
	Blockchain platform technology to prevent the forgery and modification of SPDX documents in the distribution process
	Technology to recommend Open Source SW using personal profiling
	A system for configuring a software project relationship diagram, and a method therefor
	A system for restoring Open Source project metadata information, and a method therefor
	A method to check conflicts between open source licenses based on feature points
Content, Copyrights (IP)	A system to settle the royalty on copyrights for music using blockchain
	Method and system for providing webtoon contents transaction information
	Webtoon contents purchase settlement method to judge the forgery and modification of the proof of purchase information, and such system
	Webtoon contents purchase settlement method and system to prevent forgery and modification
	Modern painting work authentication system
	Diagnostic analysis method and system for authentication of modern paintings
	Blockchain-based painting work analysis information management system and method
	DRM system and method capable of data distribution control through proxy re-encryption

⟨ Please visit LSware's website for more details. ⟩

Key R&D Projects

Titles of Key R&D Projects	
Development of blockchain-based webtoon contents settlement monitoring technology	Development of core technology of blockchain transaction suitable for microgrid environment
Development of ransomware blocking recovery technology based on Intelligent Honeypot	Research on a new copyrights service model using blockchain technology
Development of technology to make anonymous networks real name for copyright protection	Development of multi-channel-based blockchain technology to maximize performance in a small-scale node environment
Development of diagnosis and analysis technology for preservation, authentication, and verification of modern paintings	Development of Open API blockchain platform technology for the fair and transparent settlement of the royalties on music copyrights and the distribution of copyrighted theme songs, background music, and signal music
Development of simple password authentication technology that can be linked with PKI in a Smartgrid environment	Development of follow-up management protocol for SPDX-based Open Source software vulnerabilities
Development of question-and-answer technology based on the understanding of video stories to a level that will pass the Video Turing Test	Development of simulator and online consulting system for non-face-to-face Open Source SW license security consulting
Development of a system that provides real-time AR contents for Jeju tourism using drones	Development of intelligent ransomware detection solution based on abnormal behavior prediction model (K-DATA Project)
Development and demonstration of a platform for energy prosumers based on network security suitable for industrial complexes	Development of content copyright protection and application technology for digital holographic printers
Development of technology to ensure that the distribution of sound Open Source SW is boosted in an Open Source SW license protection environment	Development of an intelligent illegal crop (poppy) search system using unmanned vertical take-off and landing vehicles