

Konan Technology



AI can make the world a better place

Company Introduction

KONAN
TECHNOLOGY

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01

Company Introduction

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Konan Technology

Konan Technology is a company specializing in Artificial Intelligence software.

We have secured the original AI technologies that are not open source.

Please pay attention to Konan Technology, leading AI business through

“Human-like AIs that see, hear, understand, and speak.”



Company Name	Konan Technology Inc.
CEO	Young Sum Kim
Date of Establishment	April 1999
Core Technologies	Text AI, Video AI, Digital Twin
Key Products	Konan LLM, Konan Search/Analytics/Chatbot, Konan Watcher, Konan Voice, PHM, AI Pilot
Number of Employees	234 (as of 2023.7.24)
Address	327, Gangnam-daero, Seocho-gu, Seoul, Daeryung Seocho Tower 6,7,9 FL
Corporate Type	KOSDAQ-Listed Company

Clients

Konan Technology has secured over 2,500 customers based on its trust and technology over the past 24 years. Our major customers include large corporations such as Hyundai Motors, Samsung Electronics, and SK Telecom, as well as financial, media, and public institutions, etc.

2,500 + Clients

3,000 + Projects

Enterprise



Public



Commerce



Finance



Media



Education



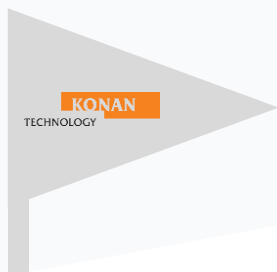
Key Products

Konan Technology offers a variety of solutions across four technology groups, based on its own original technologies: Text AI, Video AI, Digital Twin, and Foundation(Core Technologies).

Text AI	<p>Konan Search</p> <p>Multimodal AI Search</p> <ul style="list-style-type: none"> • Neural search solution • AI powered web management • Billion-scale vector search 	<p>Konan Analytics</p> <p>Make Better Decisions</p> <ul style="list-style-type: none"> • Big data analytics solution • Intuitive analytics studio • Deep natural language processing 	<p>Konan Chatbot</p> <p>Boost CX</p> <ul style="list-style-type: none"> • Hybrid conversational AI • Convenient conversation quality management tool • Deep Korean natural language understanding 	<p>pulse</p> <p>Capture Business Signal</p> <ul style="list-style-type: none"> • In-depth online media analysis • Real-time business signal analysis • Market risk sensing
Video AI	<p>Konan Watcher</p> <p>Video Understanding AI</p> <ul style="list-style-type: none"> • UX innovation through vision AI technology (Multimodal search, etc.) • High-speed processing of over 100 million video big data • MLOps-based automation of entire process 	<p>Konan Listener</p> <p>Speech Understanding AI</p> <ul style="list-style-type: none"> • Generation of domain-specific language/audio models • Simultaneous provision of voice recognition results and timestamp • Automatic correction of results through morphological analysis 	<p>Konan Voice</p> <p>Realistic AI Voice</p> <ul style="list-style-type: none"> • 3D character creation with only script input • AI capable of expressing emotions • MOS 4.75, the best audio quality 	
Digital Twin	<p>Konan PHM</p> <p>Predictive Maintenance</p> <ul style="list-style-type: none"> • Equipment/component fault diagnosis, Remaining life prediction • Service based on digital twin framework • Robust prediction even with small data using physical knowledge 	<p>Konan AI Pilot</p> <p>A Flight to a Better World</p> <ul style="list-style-type: none"> • Autonomous flight simulation • Team up with human pilots • Installed on an unmanned aerial vehicle to perform high-risk missions 		
Foundation (Core Technologies)	<p>Konan LLM NEW</p> <p>Leap, Leap ahead</p> <ul style="list-style-type: none"> • On-premise LLM for B2G/B2B • High security, Cost-effective • 13.1B foundation model (launched on 9/25) • 41B foundation model (scheduled to launch in Nov) 	<p>Konan MLOps</p> <p>Scalable and Reliable ML</p> <ul style="list-style-type: none"> • Flexible architecture • Efficient resource management • Process automation through pipelines • Intuitive dashboard 	<p>dtrain</p> <p>Konan AI Framework</p> <ul style="list-style-type: none"> • Developed with our own technologies • Flexibility to implement/scale various models • Strength in security and light weight requirements in fields such as defense 	<p>Konan DT Framework</p> <p>Digital Twin Development Framework</p> <ul style="list-style-type: none"> • Applied to services in the aerospace and defense industry • ISO23247 standard framework • Combines physics-based simulation and AI algorithms <p>Konan Language</p> <p>Programming Language</p> <ul style="list-style-type: none"> • In-house development language • Easy-to-learn language • A foundation for shortening development time

History

Konan Technology has been building unstructured big data analysis and AI technology for the past 24 years. For the next 10 years, we will write a history of leading the AI industry as an AI-specialized company that understands and services all image, voice and text.



Establishment

- 2009 · Adopted Image search engine on Nate Portal
- 2007 · Provides integrated search for Nate and Cyworld
- 2006 · Strategic alliance with SK Communications
- 2005 · Established Konan Digital Inc., foreign corporation
- 2004 · Launched 'Konan Digital Arc' based SBS Digital News
- 2001 · Konan image search technology adopted as MPEG7 international standard
- 1999 · Established Konan Technology Ltd.

Growth

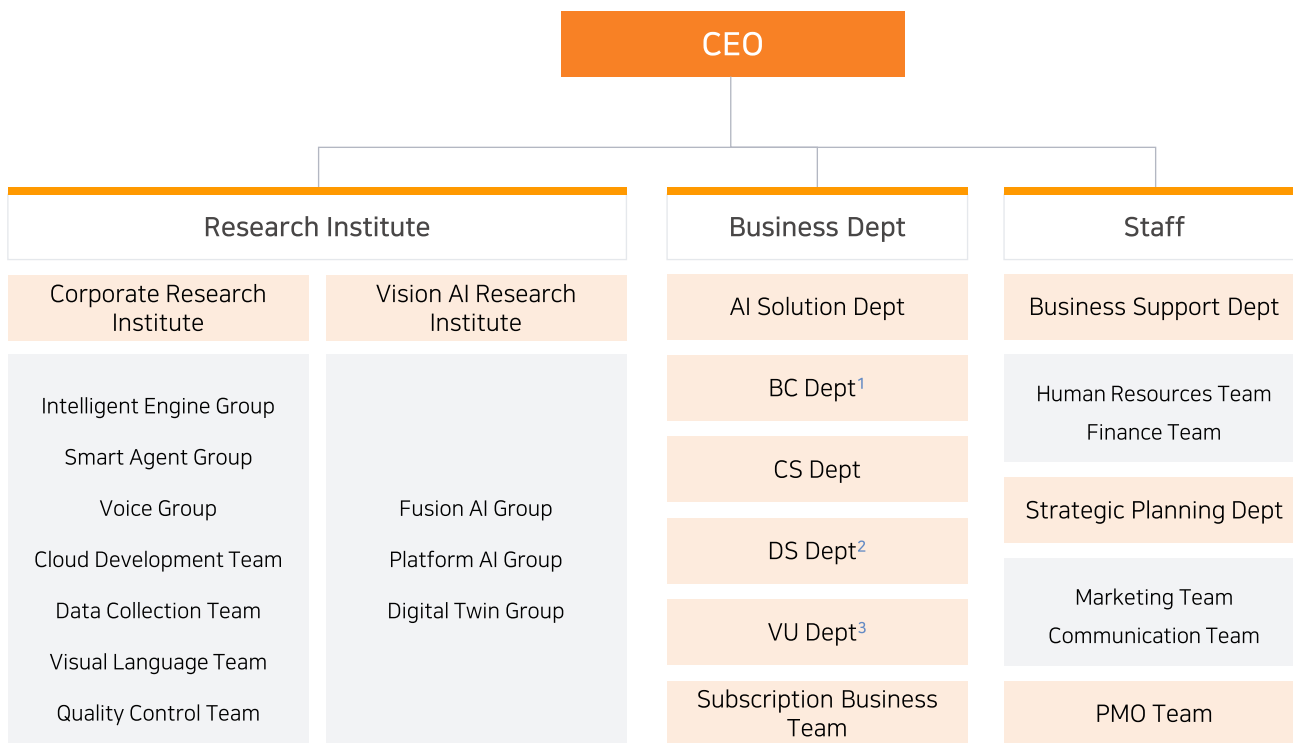
- 2019 · Business Agreement on AI-based Services with SK Broadband Content Platform
- 2018 · Launched AI-enhanced products ('Konan Search 5, etc.)
· 'Konan Search 5', 'Konan Bot' GS Certification
· Completed automatically generated subtitle project for Korea National Open University
- 2017 · Started applying AI technology to commercial products
· 'Konan Analytics 4' GS Certification
· Launched voice recognition technology product 'Konan Listener'
· Collected and calibrated data for video understanding Developed automated system(VTT)
- 2016 · SP(Software Process) Certification Grade 2
- 2015 · 'Konan Media Arc' GS Certification
- 2012 · Opened social analysis platform 'pulseK'
- 2011 · Launched start TV search platform 'Interactive Semantic'

Maturity

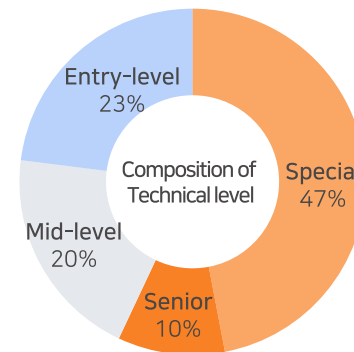
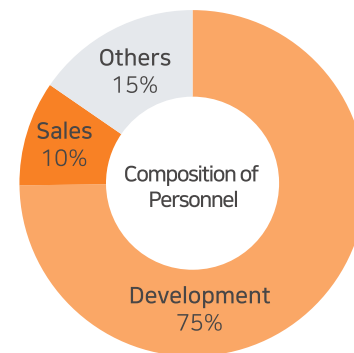
- 2023 · Selected as the 2nd 'Defense Innovative Company 100'
· Konan Chatbot Cloud Security Authentication
· Launched 'Konan LLM'
· 5.1 billion contract to build 'R.O.K ministry of national defense Intelligent Platform'
· Signed a business agreement with KOSPO to create an AI and data industry ecosystem
· 'Konan Watcher 4' GS Certification Grade 1
· Signed 3 contracts with KAI (AI Assistant, development of DB construction and processing technology for PHM system, frequency response prediction system, etc.)
· Selected as an emerging AI+X Top 100 Company
- 2022 · Konan Technology (402030) Listed on KOSDAQ
· MSIT Receives Ministerial Award for 'Enabling Data Openness and Distribution'
· AI-based aerospace technology enhancement agreement between Konan and KAI
- 2021 · 'Konan Chatbot 3' GS Certification Grade 1
· Development of Konan Deep Learning Framework (100% In-house technology)
· Selection of best practices for active administration of pan-ministerial ministries - Ministry of Personnel Management
- 2020 · Introduction of AI Testing Guidelines
· Selected as best practice for SP certification

Organizational Chart

Konan Technology is an organization composed of artificial intelligence software experts.



*1.BC Dept =Bigdata Convergence Dept, 2.DS Dept =Data Science Dept, 3.VU Dept =Video Understanding Dept



*As of 2023.7.24, 234 people



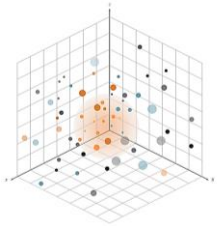
02

Text AI

- 1) Multimodal AI Search, **Konan Search**
- 2) Make Better Decisions, **Konan Analytics**
- 3) Capture Business Signal, **pulseK**
- 4) Boost CX, **Konan Chatbot**

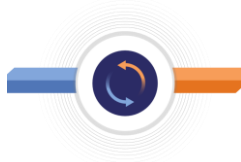
Multimodal AI Search, Konan Search

Neural search-based semantic search



- Vector search enables synonym search without a synonym dictionary
- Image vector search enables similar image search without image captioning

Hybrid Search System



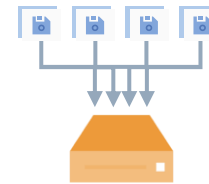
- Increase search accuracy with a hybrid approach that analyzes data with rule-based NLP technology first and then further analyzes data with deep NLP technology

Multimodal AI Search



- Search by taking pictures without typing
- Provides a solution for the problem of difficulty in obtaining desired search results using only a single means, by simultaneously learning complex information such as text and images through multimodal search

Disk-based, large vector search



- Disk-based algorithms support Vector Search of Billion-Scale, processing at index speed 9 times faster than open source

Multimodal AI Search Konan Search 6

Konan Search Use Cases

Centralized Document Management

- A system that allows you to centrally search and manage large amounts of documents distributed within a company.
- Distributed processing based on big data ensures performance even as document volume increases
- Build and share a company-wide knowledge base
- Boosts work efficiency by quickly finding necessary information



Job Portal

- Provided a robust solution the 1st and 2nd largest online Job Portal in Korea
- High-speed service through near-real-time index/search
- Provides optimal solutions for complex service requirements by supporting various search/sort queries



Open Government Portal

- 2.3 billion document search engine in the information disclosure portal of the Ministry of the Interior and Safety
- About 4 times higher capacity for document search than the existing system with a similar number of servers.



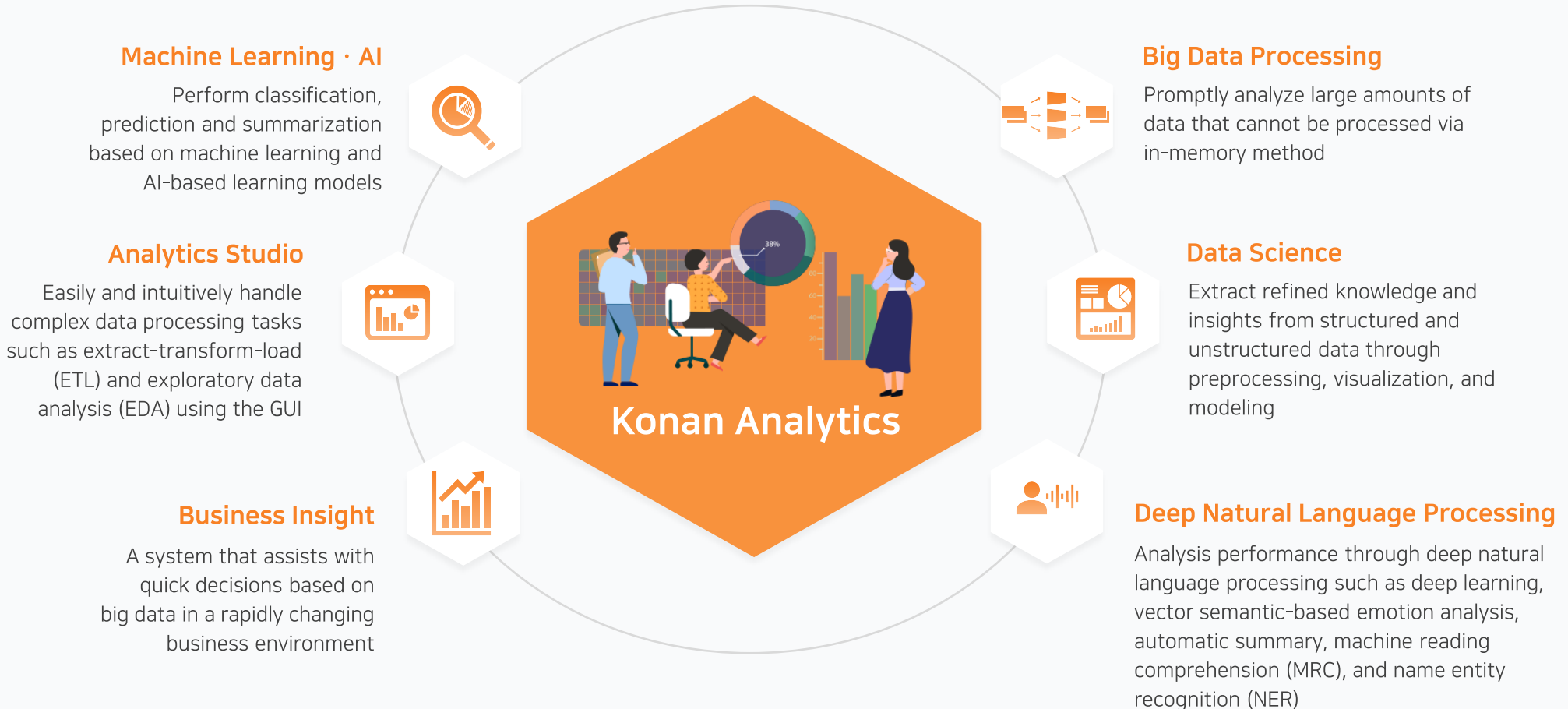
Lifestyle E-commerce and M-commerce Search

- Supports mobile commerce search traffic of 'O!House' with more than 10 million users operate
- Customers who are satisfied with the stable service of Konan search engine were gradually replacing their existing open-source searches with it



Make Better Decisions, Konan Analytics

Konan Analytics is an 'intelligent text analytics engine' that analyzes structured and unstructured data based on machine learning, artificial intelligence, and data science technologies to discover business insights.



Konan Analytics Use Cases

AI Contact Center

- Automated consultation environment through analysis of calls between customers and CSR*
- Improves the level and accuracy of consultation by monitoring whether CSR omits guidance or makes mistakes
- Customer consultation available 24 hours a day without waiting for CSR

*CSR : Customer Service Representatives



VOC Automatic Summarizing

- Extracts key sentences from documents and summarize them
- Summarizes documents using BERT and Text Rank models
- Saves time understanding and summarizing documents



Learning Platform

- Recommends highly relevant learning content based on unstructured data(jobs, interests, activities) for 'Ministry of Personnel Management'
- Manages the collected human resource data with AI technology by linking it to the soldier's life cycle for 'The Ministry of National Defense Republic of Korea'



Live Shopping

- Predicts product risks by analyzing text (reasons to cancel/return) and structured data (average number of returns, etc.)
- Utilizes BERT to detect phrases that appear to violate broadcast review regulations
- Reduces losses by anticipating mass cancellations/returns/penalties



Capture Business Signal, **pulseK**



Data Collection/Processing

- Real-time collection for big data analytics
- High-speed management of large amounts of data
- Efficient change management of collection targets
- Support for the collection of different channels
- Reliable processing of data over 10 million/ 1D
- Distributed/high-speed web crawling
- High-speed DOM parsing
- RDBMS high-speed content management
- Hadoop content management
- Flexible data transformation

Analysis Services

- Real-time monitoring, insight analysis
- Provision of a customer-specific analysis model
- The only analysis environment that supports both strong and weak signal analysis
- Dictionary/non-dictionary-based morpheme analysis
- Document/sentence selective analysis
- Text mining, data mining
- Growth volume/rate future signal analysis
- Biz domain dictionary-based TO analysis
- Sensibility/emotional analysis using ML/DL

Big Data Consulting

- Derive future insights from various analytical models
- Provide consulting in various areas such as monitoring, crisis management, and Biz Trend analysis
- Discover new value through predictive and normative analysis beyond diagnostic analysis
- Text mining, data mining
- Co-occurrence and co-relation analysis
- Clustering/classification using ML/DL technology
- Time series analysis and predictive analysis
- Various domain knowledge

pulseK Use Cases

Data Collecting/Processing

- Provided loading data to a social big data system for 'Woori Bank'
- Collected data for risk monitoring of 'GM KOREA'
- Collects data for research on economic policies and issues at 'KDI(Korea Development Institute)'



Big Data Consulting

- Establishes policy direction by analyzing people's thoughts on 'The Ministry of Culture, Sports and Tourism'
- Seoul National University published '2022 Trend Korea' by researching trends across society and analyzing big data using pulseK.



Trend Analysis Service

- 'INNOCEAN' used pulseK to understand the lifestyle and characteristics of the target.
- 'Shinhan Card' used pulseK to analyze social consumption trends and the target's lifestyle.

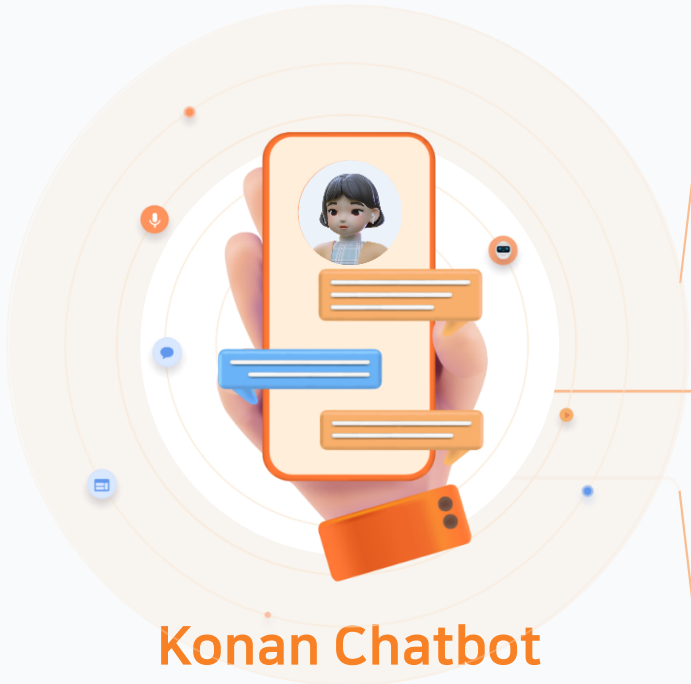


Analysis Service

- Real-time online monitoring service to discover policy issues and establish communication strategies for 'The Seoul Metropolitan Government'
- 'pulseK' is used for online market research for 'SK Magic' product sourcing.
- Real-time issue discovered service for active use of fact-checking open platform for 'Community Media Foundation'



Boost CX, Konan Chatbot



Konan Chatbot

Conversational Natural Language Understanding

Document AI

Reduce time and cost by automatically building conversation data from structured documents such as Q&A and unstructured documents such as manuals and regulations

Machine Reading Comprehension

Apply machine reading to find and present areas of answers to questions in a document or paragraph

Pre-trained DL Model

Leverage Bidirectional Encoder Representations from Transformers (BERTs) to provide appropriate answers without additional learning

Conversation Quality Management

Provides the ability to improve and maintain conversation quality with conversation history management, conversation placement testing, and design/service mode support

Deep natural language processing

Ensure high response rates through multilayer intention inference by deep learning and natural language analysis

Easy and intuitive collaborative development tools

Easily align with legacy systems with minimal coding through the Visual Conversation Scenario Editor

Konan Chatbot Use Cases

Workplace Services

- Operated chatbots in 6 areas including HR, IT, health, production, and finance
- Increased utilization and work efficiency for each system
- Response rate of over 90% and error rate of less than 9% (continuously improving response rate/correct response rate)



National Tax Service

- Tax consulting on value-added tax, comprehensive income tax, and year-end tax reporting
- Public chatbot used by 30 million subscribers
- Handles over 100,000 questions per month
- Selected as an excellent work innovation case



Academic Advisors Assistant

- Personalized inquiries (bills, timetables, grades, etc.)
- Provides information within the university (schedule, location, contact numbers, diet, etc.)
- Available to respond 24 hours a day



Public E-library

- Integrated search link within the National Assembly Electronic Library
- Provides interactive UI for a variety of search criteria(title, author, publisher, etc.)
- Immediately provides rich answers by combining images, cards, and text





03

Video AI

- 1) Video Understanding AI, **Konan Watcher**
- 2) Speech Understanding AI, **Konan Listener**
- 3) Realistic AI Voice, **Konan Voice**

Video Understanding AI, Konan Watcher

Konan Watcher is a video-understanding AI solution that combines large-capacity image processing technology and artificial intelligence (AI) technology.

Konan Watcher

Deep Vision



Video Understanding



Deep Speech



Character/Object Recognition

- Provide automatic tagging and deep learning tools
- Image processing technology before/after recognition
- Application of data augmentation generation correction technology to secure learning data
- Leverage a variety of neural network algorithms to develop deep learning models, tune hyperparameters, refine and scale learning images to optimize performance and quality

Digital Contents and Metadata Mgmt

- All-In-One Workflow for video collection, analysis, processing, tagging, and learning
- Collection of learning contents through scene segmentation and transition recognition
- Conversion of various image formats and resolutions, high-speed data transmission
- Extraction and management of various deep meta-information in digital content

Speech Recognition/Speech Synthesis

- Application of speaker adaptation end-to-end
- Voice recognition model
- Provide automatic subtitles for real-time videos
- Easy and fast editing through subtitle-editing management UI/UX
- NLP-based language dictionary application, domain-specific language and voice model management
- Provide high-quality reading and dialogue-synthesized voice through a combination of multilingual voice synthesis technology and small data-based personal voice modeling techniques

Konan Watcher Use Cases

OTT Platform

- Provides personalized search and recommendation services by using deep learning technology to analyze deep metadata in contents such as movies, dramas, and shows
- Automatically provides key highlight videos such as eating and action scenes



Defense and Public AI Platform

- Provides a service that identifies allies and enemies by analyzing video and photo data for 'The Republic of Korea Army'
- Built battlefield scenarios suitable for the military command and control system for 'The Republic of Korea Army'
- Improves work efficiency by supporting people clustering service for 'Presidential Archives'



E-learning Platform

- Subtitles online courses for students including those with hearing loss
- Creates accurate subtitles using speaker adaptive acoustic modeling to improve voice recognition rate



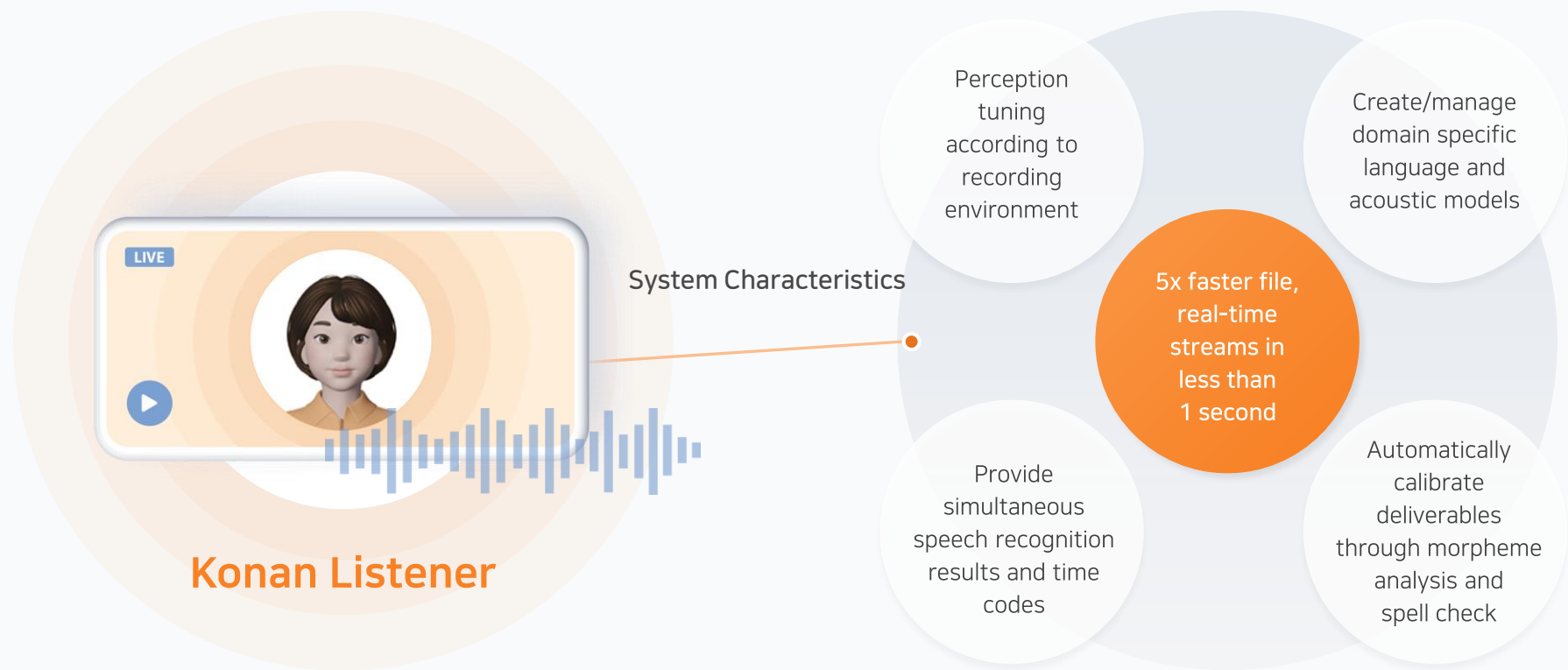
Contents Management Solution

- Built 'SBS' PDS/NDS CMS
- Built 'KBS' production/reporting NPS and advertising workflow
- Built 'YTN' integrated news information system



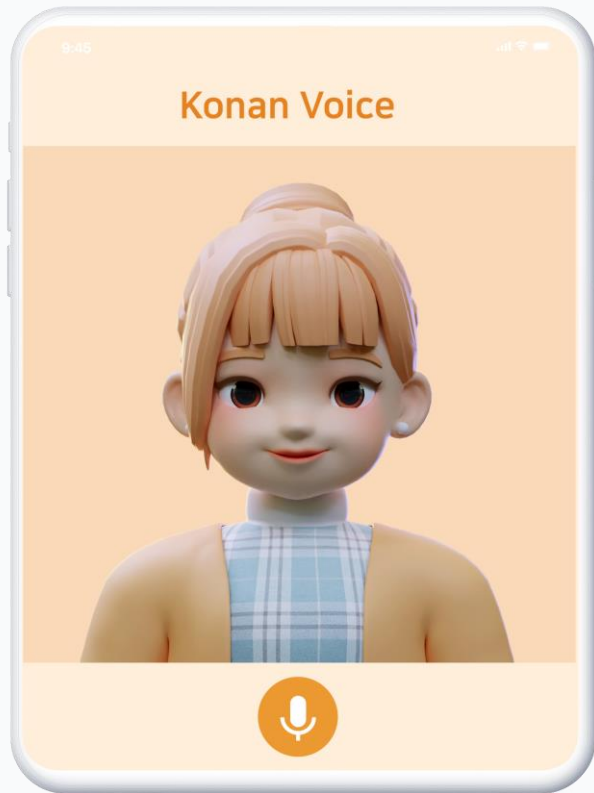
Speech Understanding AI, **Konan Listener**

Konan Listener is a speech recognition solution that recognizes speech in a video, converts it into text, and provides it with a time code. The competitive edge is the ability to automatically correct voice recognition results through in-depth text analysis technology, along with high speed that processes files five times faster and streams in real-time.



Realistic AI Voice, Konan Voice

Konan Voice, an artificial intelligence voice actor, is an end-to-end speech synthesis solution that uses a single neural network technology to synthesize voice waveforms from input script text in real-time. It has the competitive edge to quickly synthesize the most natural high-quality voice.



- 3D characters with 6 facial emotions**
 Type your script text and the 3D character will automatically lip-sync and dubs.(6 emotions available: happy, sad, angry, embarrassed, anxious, and nervous)
- Easy to use**
 High-quality artificial intelligence speech synthesis service that generates voices by selecting a voice actor and inputting a script
- High-Quality Voice that Surpasses Professional**
 MOS 4.5+ natural, high-quality voice production capability
*Mean Opinion Score (MOS): A quality index that subjectively evaluates voice quality into five levels
- Natural Reading that Understands the Context**
 Provides the most natural reading quality by understanding context and meaning, such as spacing correction, sentence closing-ending recognition, postposition correction, and dual expression recognition



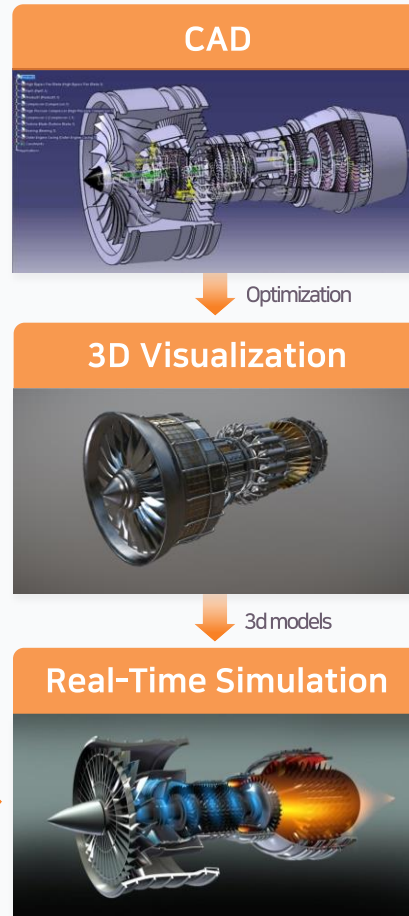
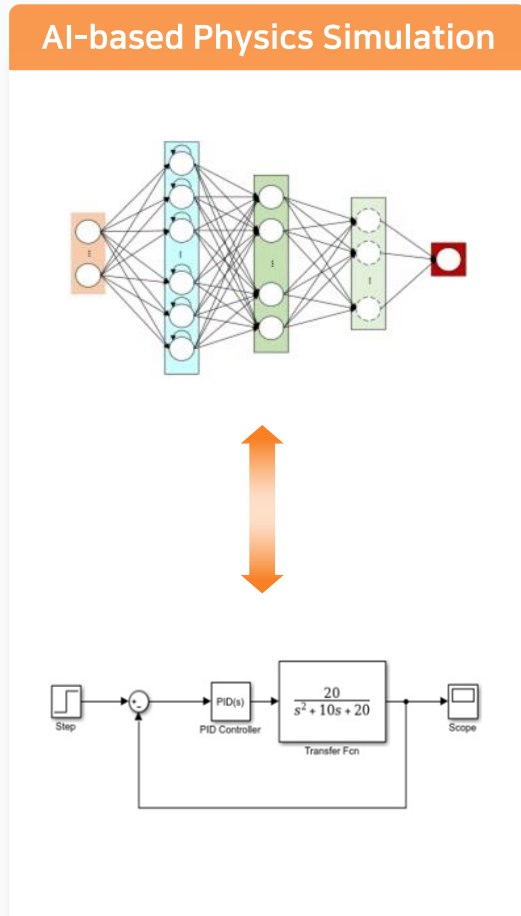
04

Digital Twin

- 1) Predictive Maintenance, **Konan PHM**
- 2) A Flight to a Better World, **Konan AI Pilot**

Predictive Maintenance, Konan PHM

PHM is a solution that combines digital twins and AI technologies (PBDL and RL) to help diagnose equipment/component failures and make residual life prediction decisions.



- ### Features
- AI analytics service based on Deep Learning
 - Monitoring function for faster fault diagnosis and lifetime prediction in the field
 - When equipment/parts fail, it helps to find the cause and make decisions to solve it

- ### Key Technologies
- Time Series Sensor Data-Based Deep Learning Diagnostic Algorithm
 - Physical Simulation Interlinked Deep Learning (PINN) Algorithm
 - Real-time, high-quality visualization
 - Digital twin for fault diagnosis/prediction/cause analysis of equipment

A Flight to a Better World, Konan AI Pilot

Konan AI pilots can team up and collaborate with pilots. It learns and understands missions like a human and can perform high-risk missions on behalf of humans.



Autonomous Flight Simulation

Team up with human pilots

Installed on an UAV* to perform high-risk missions

Features

- Simulated engagement training with human pilots, including many-to-many engagements
- Perform missions for tactical purposes and provide a briefing system to analyze/validate them
- Realistic mission rehearsal and simulation of edge cases* at low cost

*Edge cases: rare situations, extreme situations

Key Technologies

- Autonomous flight simulation utilizing hybrid reinforcement learning
- 3D rendering technology that visualizes real fighters
- Installed on an UAV* to perform high-risk missions instead of humans
- Voice recognition command and control

*UAV: Unmanned Aerial Vehicles



05

Foundation (Core Technologies)

- 1) Leap, Leap ahead, **Konan LLM**
- 2) Konan AI Framework, **dtrain**
- 3) Scalable and Reliable ML, **Konan MLOps**
- 4) Programming Language, **K-Language**

Leap, Leap ahead, **Konan LLM**

Konan LLM is an on-premise Large Language Model for public institutions and company. Security is enhanced by blocking confidential leaks at source, and hallucinations are minimized by presenting 'reference links' in the generated answers in conjunction with the Vector search engine 'Konan Search 6'



Leap, Leap ahead

Konan LLM



On-premise

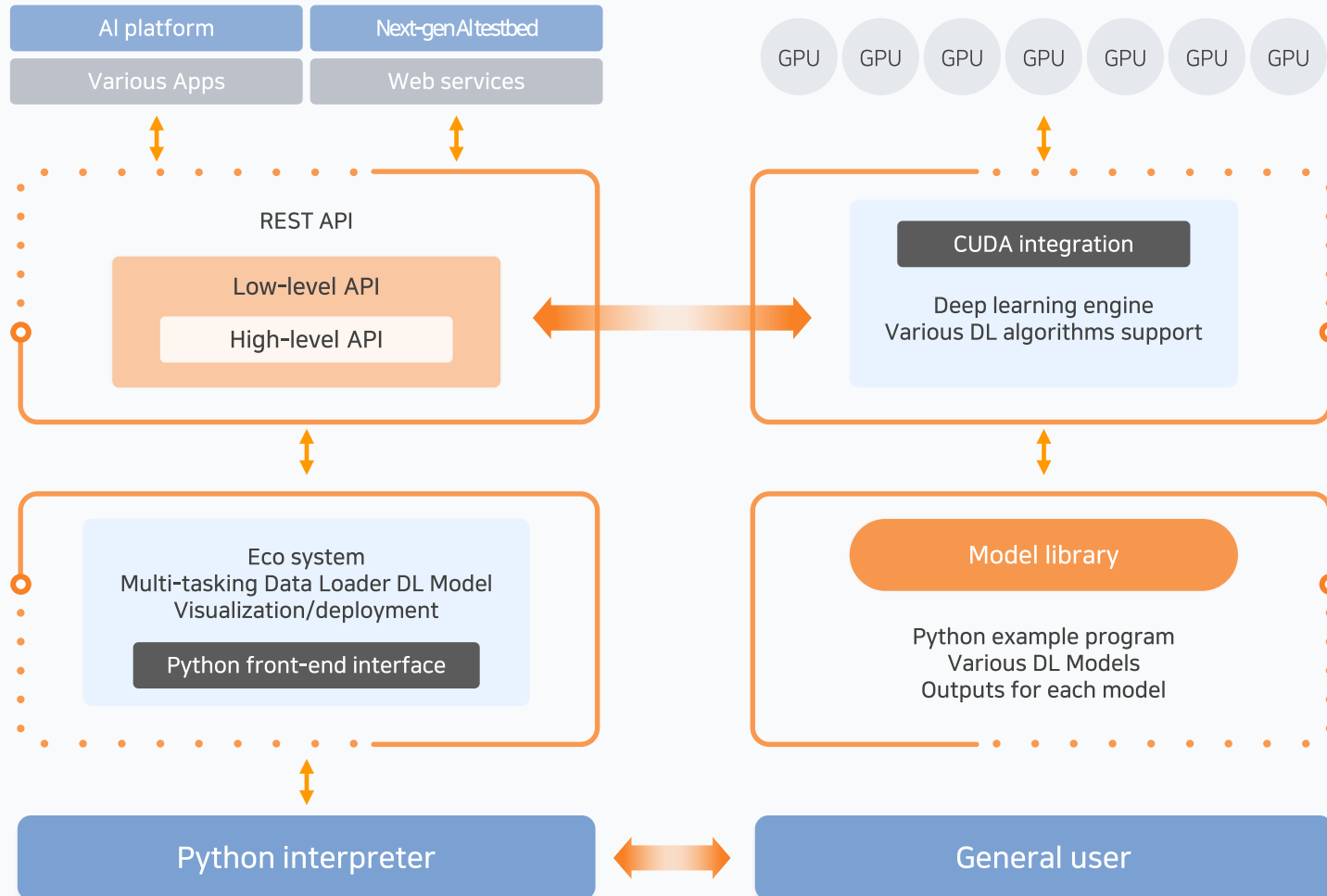
**Smaller Parameter Sizes,
More Training Tokens**

- Parameters: 13.1B, Tokens:492B (Korean: 284B)
- Parameters: 41B, Tokens:700B (Korean: 322B)

Retrieval-augmented generation
(by adding Konan Vector Search Engine)

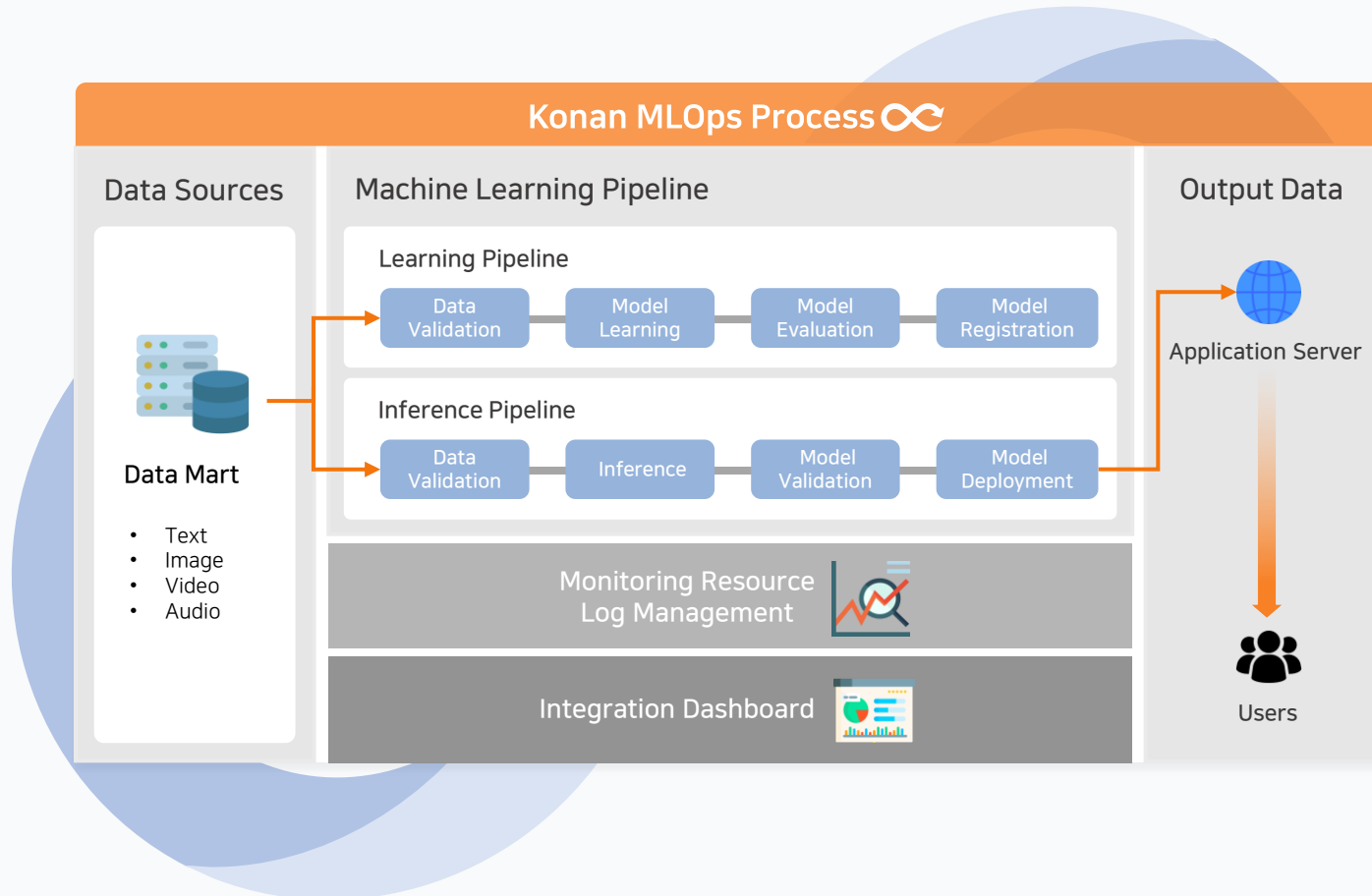
Konan AI Framework, **dtrain**

dtrain is a solution developed with a purely in-house AI framework that has strong points in flexibility, lightweight, and reliability.



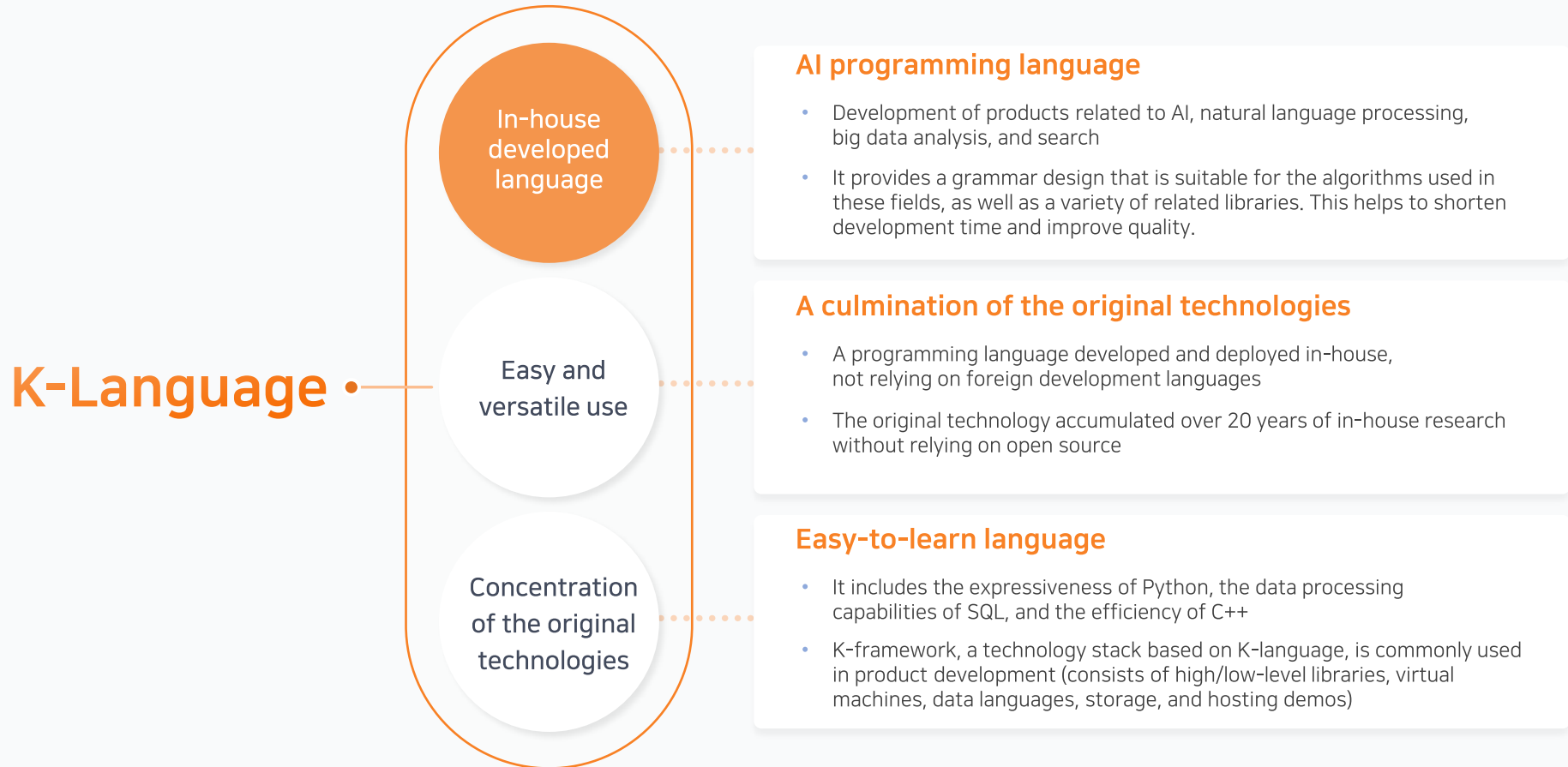
Scalable and Reliable ML, Konan MLOps

Konan MLOps automates the entire process from deep learning model training to deploying, providing operation convenient. It is also a flexible solution that provides an optimized operating environment tailored to each project's characteristics.

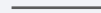


Programming Language, K-Language

K-Language is a programming language developed by Konan Technology for AI and big data development. It is the foundation technology for all product development in the Text AI field.



Thank you



www.konantech.com

konan@konantech.com

02-3469-8555