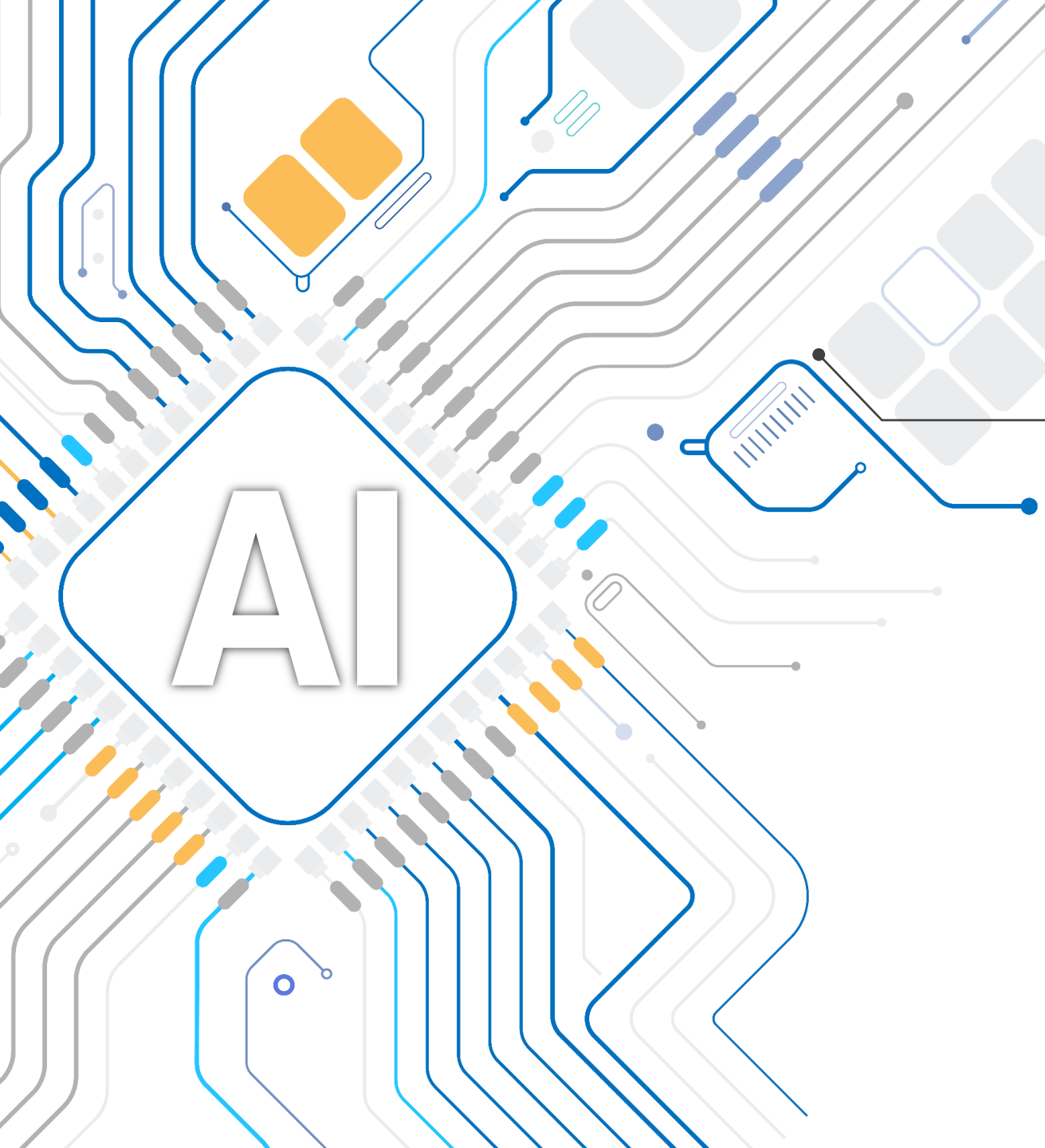
Ministry of Science and ICT

Policy Directions for the Hyperscale AI Era

October 27, 2023



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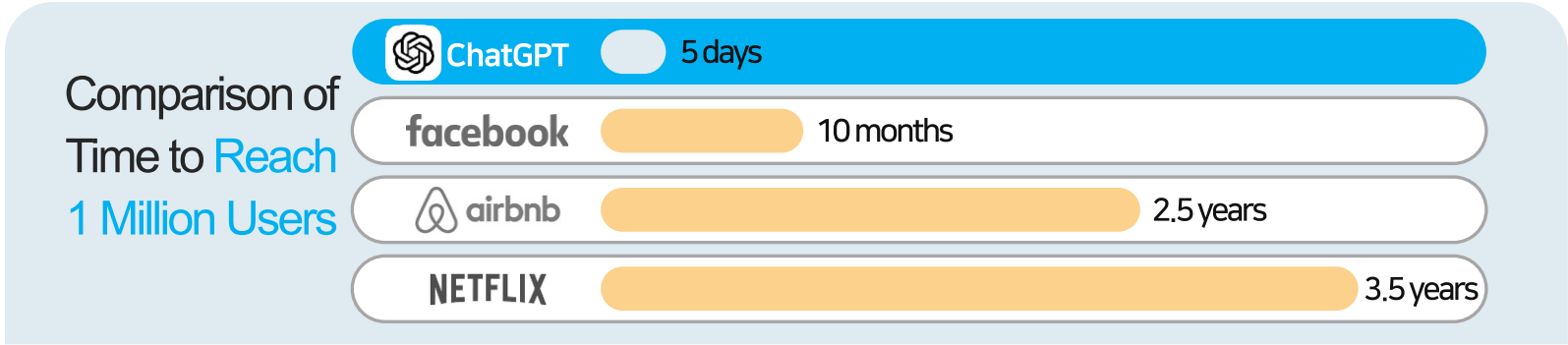
I Rise of Hyperscale AI

Introducing ChatGPT

Possesses **creative abilities**,
including **interactive search, writing** essays, poems, and novels,
as well as proficient **software coding** and debugging.

Achieved 1 million users in just 5 days after launch,
and **10 million users in 40 days**; significantly shorter periods
compared to other major services.



☑ Previously vague expectations for AI turned out to be highly useful, marking the onset of a new phase in AI competition.

I Rise of Hyperscale AI

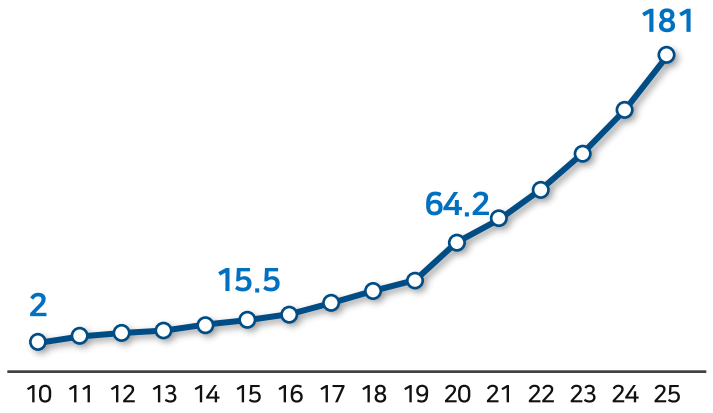
Hyperscale AI

A generative AI model with a massive model size and extensive training data that learns the context and meaning of sentences through word relationships, and infers/generates the next word.

This achievement is based on ① **extensive data**, ② **advanced algorithms (such as transformers)**, and ③ a dramatic improvement in **computing power**.

Data

CAGR 35% ↑(64.2 in 2020→181 in 2025)



Source: Statista (2022, ZB)

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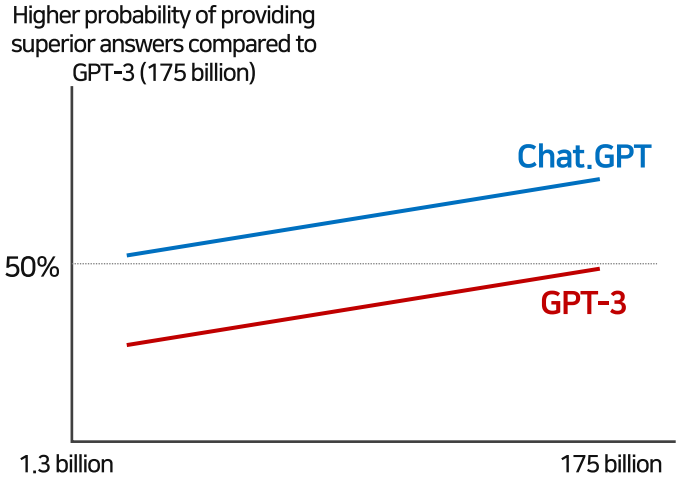
Algorithms

Transformers, reinforcement learning



Source: OpenAI (2022)

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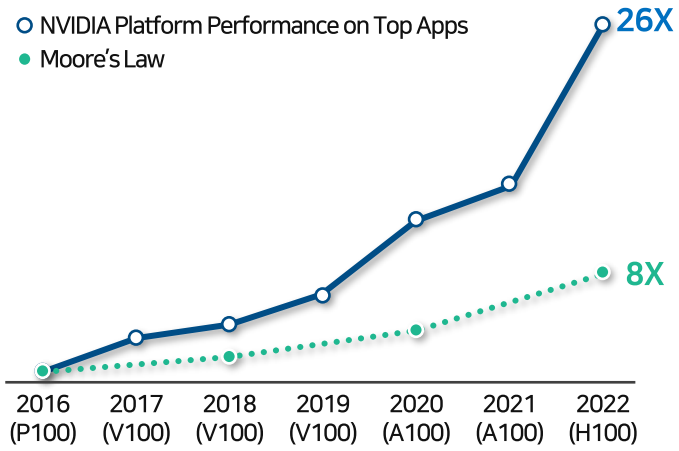
Computing Power (AI Chips)

26X GPU performance in just 6 years



Source: NVIDIA (2022)

II Status of Hyperscale AI Development

2023.3.21 Microsoft
Integrated an image creation tool into Bing

2023.2.24 Meta
Unveiled LLaMA

2022.11.30 OpenAI
Launched ChatGPT service

2023.3.5 upstage
Launched AskUp service

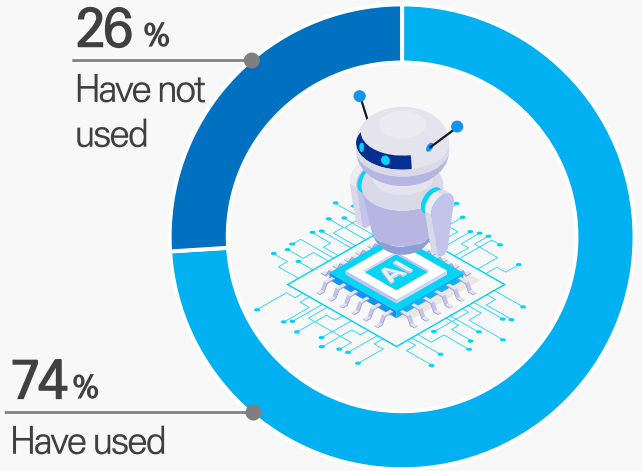
2023.5.10 Google
Launched Bard service

2023.7.10 kakaobrain
Unveiled Karlo 2.0

2023.7.19 LG AI Research
Unveiled EXAONE 2.0

2023.8.24 NAVER
Unveiled HyperCLOVA X

More than 7 in 10 American workers **"have experience using generative AI at work"**



※ The Harris Poll, US (March 2023)

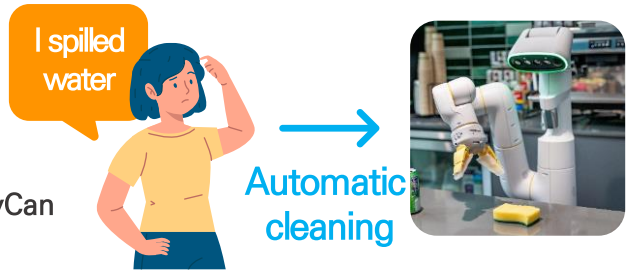
AI is readily available to all through PCs, smartphones, etc. → Signaling the normalization of AI

III Hyperscale AI's Influence

AI Permeating

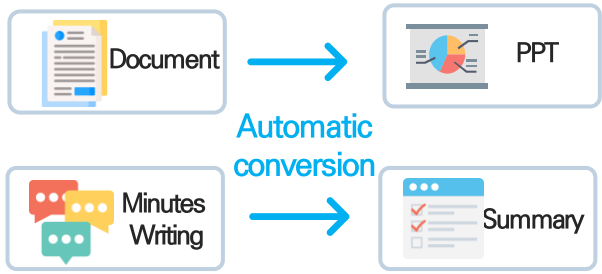
Everyday Life and the Workplace

Google PaLM-SayCan



Microsoft Copilot

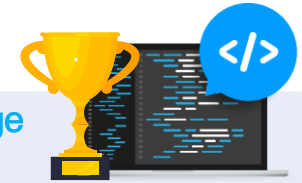
Naver CLOVA Note



DeepMind AlphaCode

AI achieving above-average performance at an online coding competition

※ Codeforces competition (2022)



Services Understanding Human Intentions

Overwhelming Efficiency Improvement

Text-based Coding without Coding Knowledge

Revolutionizing Existing Industries

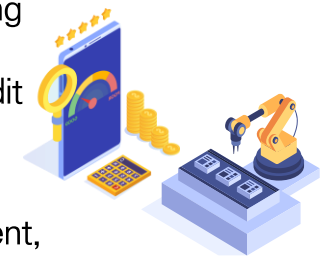
Learning and Education Support

Creative Activities Assistance

AI Empowering

a Digital Society

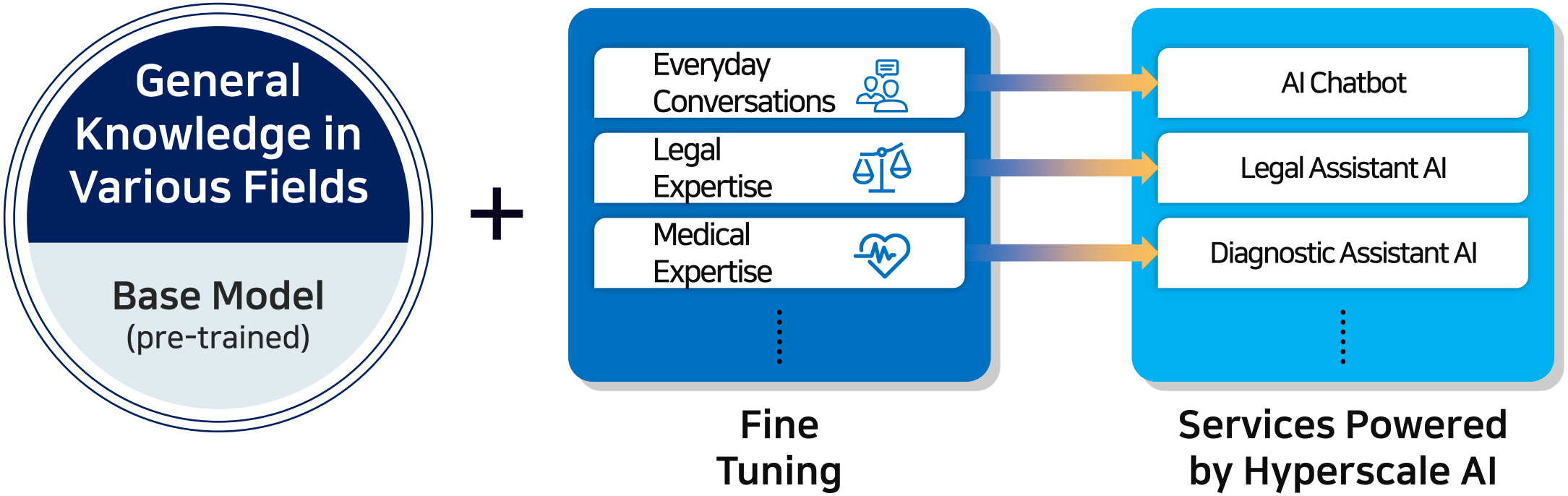
- [Finance] Broad applications including customer consultation, financial product recommendations, and credit evaluations.
- [Manufacturing] Applications like defect detection, quality management, and production planning.



- Student learning tools and support for teachers' educational materials creation.
- Providing tailored education through level assessments.

- Creating artistic works like music compositions, drawings, etc.
- Creating advertising copies, essay writing, content creation, etc.

III Hyperscale AI's Influence



▶ Training hyperscale AI models with extensive expert knowledge → Infinitely expandable to all industries ◀

III Hyperscale AI's Influence (Stanford HAI)

Hyperscale AI, leveraging human-level language and visual capabilities, significantly **expands the existing digital domain, enhancing productivity and efficiency across all industries.**

Extensive collection of controlled group data by creating 'synthetic patients' from real patient information

Healthcare

Finance

Wide-ranging applications, including customer consultations, recommendations for financial products, credit assessments, and identification of financial irregularities.

AI literacy is becoming essential to offer tailored educational services for students, along with providing individualized feedback through continuous monitoring.

Education

ICT

Semiconductor

Media

Serving as a supplementary tool in journalism, enabling the creation of personalized content, addressing reader inquiries, and gathering data.

Manufacturing

Assisting in tasks such as preparing documents for legal representatives, crafting judgments for judges, and conducting searches of legal texts and precedents.

Law

Retail

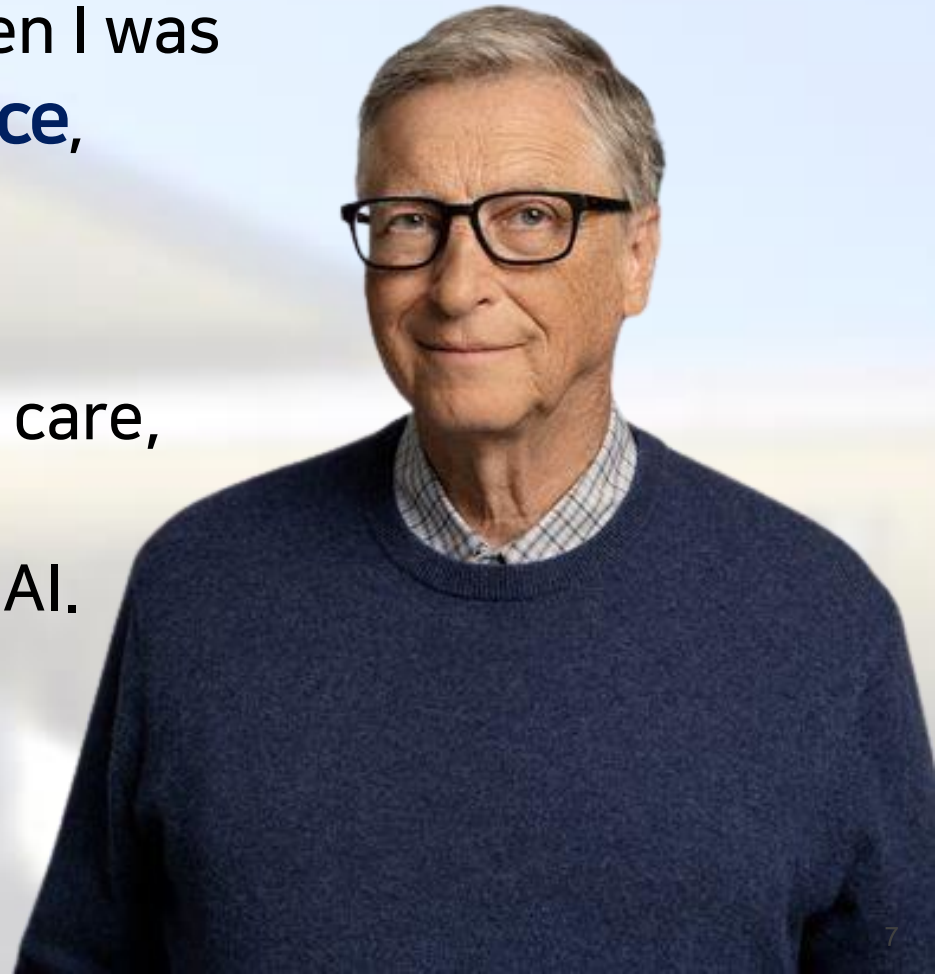
III Hyperscale AI's Influence (Microsoft Founder Bill Gates)

"

In my lifetime, I've seen two demonstrations of technology that struck me as **revolutionary**. The first time was when I was introduced to a Windows **graphic user interface**, and the second big surprise was the **Open AI team's artificial intelligence**.

AI will change the way **people** work, learn, get health care, and communicate with each other.
Entire **industries** will reorient around hyper-scale AI.
Businesses will distinguish themselves by how well they use it

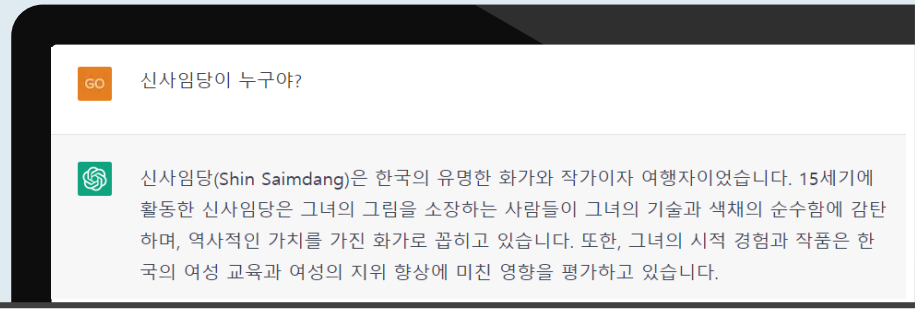
"



III Hyperscale AI's Influence (Voices of Concern)

☑ An era of ubiquitous AI: Significant concerns arise alongside the high expectations

○ Technology — Inaccurate Answers



Industry — Big Tech Dominance Leading to Potential Job Reduction

☑ Professions threatened by hyperscale AI

- Low-level coding engineers
- Content creators like journalists and writers
- Graphic designers

Legal — Copyright Issues

Society — Social Acceptance

The widespread use and integration of hyperscale AI in our daily lives (education and employment) lead to concerns. Without proper preparation, this could potentially lead to social disruption.

☑ Controversy Surrounding ChatGPT in Education

Prohibition of use for cheating **VS** Active use as an auxiliary tool

Ⅳ Policy Environment (Domestic and International Trends)

Global Evaluations

Artificial Intelligence and DemocraticValues
Ranked 1st place for two consecutive years (2022–23)
(Center for AI and Digital Policy, US)

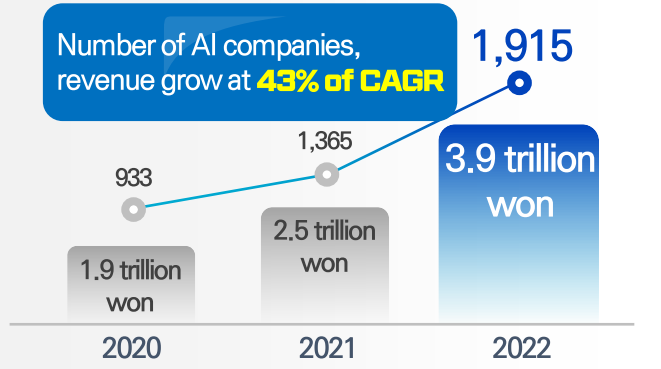
The Global AI Index 2023
1st: USA
2nd: China
World's 3rd place
Singapore, UK, Canada, Korea
(Tortoise Media, UK)

Korean Companies' Endeavors

Proprietary Hyperscale AI
NAVER
LG AI Research
SK telecom
kt
kakaobrain

Startup Challenges
upstage
rebellions_
Victories in Global Competitions
VUNO
VOINOSIS

AI Industry Growth



International Discussions

EU
Bills submitted to classify and regulate AI into four categories (Apr. 2021)

US
Leading AI companies agreed on voluntary safety and security measures for generative AI models (Jul. 2023)

G7
Established trustworthy AI goals and international norms concerning generative AI

UK
Summit scheduled for establishing responsible AI regulations (Nov. 2023)

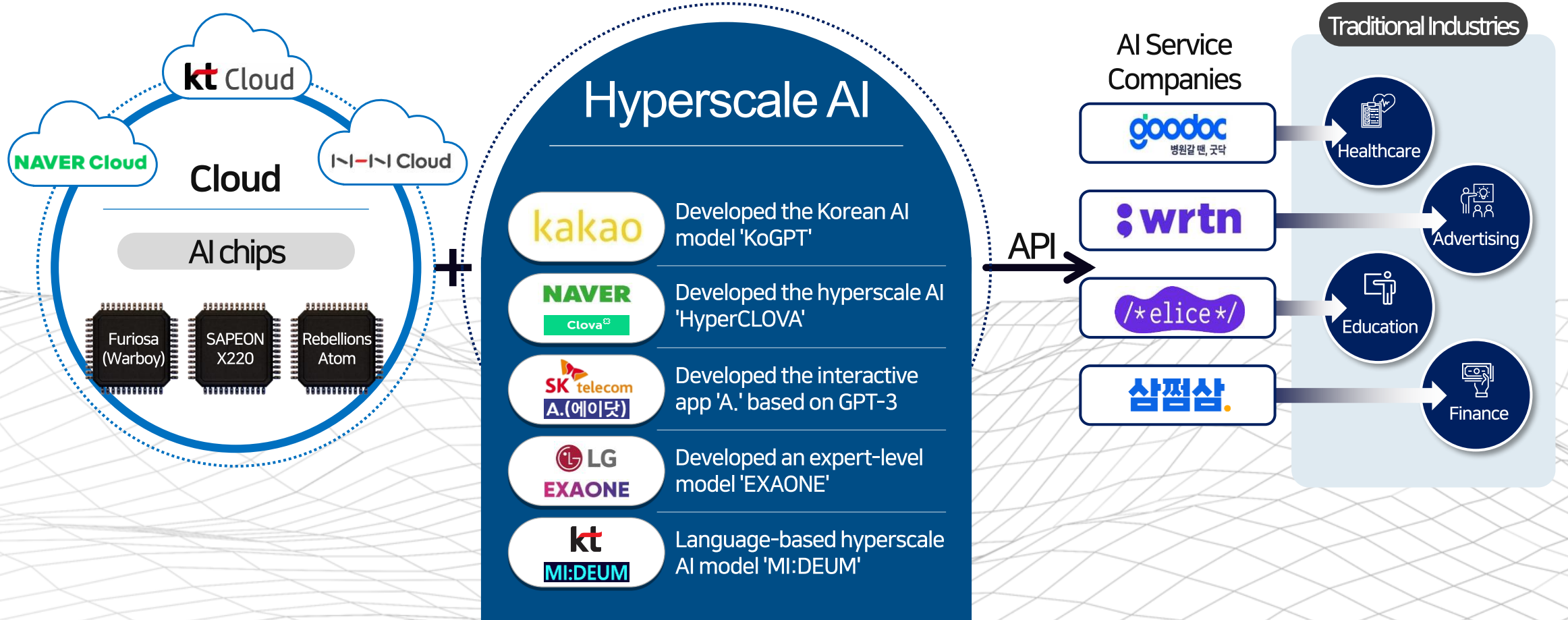
Global Governance Proposal

Direction of the New Digital Order

Establishment of an international organization under the UN for establishing digital order and regulations

Ⅳ Policy Environment (Korea's Hyperscale AI Industry Ecosystem)

☑ Korean companies are now actively participating in the hyperscale AI race, starting to produce visible results.



V Enhancing Hyperscale AI Competitiveness

Vision

Accelerating the transformation into a digital economy with smart artificial intelligence

Goals

Hyperscale AI Platform

Begin global market expansion
particularly among non-English speaking countries, aiming to be the top Korean-language platform

Hyperscale AI Application Services

Foster a collaborative ecosystem between companies to **lead in specialized domains worldwide**

Implementation Strategies

1 Expanding Technical and Industrial Infrastructure for Hyperscale AI

2 Creating an Ecosystem for Hyperscale AI Innovation

3 Establishing Nationwide Institutional and Cultural Foundations

V Strategy 1: Expanding Technical and Industrial Infrastructure for Hyperscale AI

Supplement the core AI infrastructure support policy for nurturing hyperscale AI

Data	**Build learning data** centered on labeled data	**Construct core data for training hyperscale AI** * High-quality, large-scale text (200 types, equivalent to 150,000 books)
Algorithms	Continue basic AI research, including enhancing AI learning capabilities and strengthening reliability	**Pursue new technology development to overcome hyperscale AI limitations*** • Not reflecting the latest information and providing false answers, etc.
Computing Infrastructure	Launch the K-Cloud project, including the development of AI semiconductor technology and NPU Farm demonstration	**Advance core K-Cloud technology for hyperscale AI utilization** * Develop parallel/distributed processing support software, data processing accelerators, etc.

V Strategy 2: Creating an Ecosystem for Hyperscale AI Innovation

Create a hyperscale AI ecosystem led by the private sector and supported by the government

Formation and Operation of a Hyperscale AI Council

Promote collaboration, including private investment, new service development, and overseas expansion (from 2023)

Support for the Growth of AI Companies

Leading hyperscale AI projects

- Flagship hyperscale AI projects in five major private sector domains (healthcare, law, psychological counseling, content, and academia).
- Enhancing efficiency in public services, including drafting press releases and addressing citizen complaints.

Developing and promoting hyperscale AI-based SaaS

- Support small and medium-sized SaaS companies for the utilization of hyperscale AI models and computing resources.
- Enter into the global SaaS marketplace, providing marketing support.

Dissemination of AI solutions and creation of initial demand

- Support the development of AI products and services in the commercialization stage.
- Expand AI voucher users overseas and promote convergence projects of hyperscale AI with the metaverse.

AI Talent Development

Nurturing and capacity-building for hyperscale AI experts (from 2023)

Train advanced and specialized AI experts at various levels, including AI graduate courses (2023-2027)

As is

Regular courses including AI master's and doctoral programs	Non-regular courses for employees, etc.
65,000	132,000

To Be

Talent development	Foster AI specialists through Industry-academia collaboration projects
Capacity building	Expand education programs on the use of hyperscale AI
Literacy improvement	Provide guidance on how to use hyperscale AI for the general public (1 million people)

V Strategy 3: Establishing Nationwide Institutional and Cultural Foundations for AI Innovation

Establish a new order in the era of advanced digital technologies, such as hyperscale AI

Increasing Societal Acceptance

☑ Promote voluntary participation-based evaluation of the risks and performance of hyperscale AI (from 2023)

Operation of 「Digital New Order Committee」, 「AI Legal Reform Group」, 「AI Ethics Forum」, etc.

Sectors	Healthcare	Manufacturing	Finance	Law	…
Issues	Fair competition	Security	Ethics	…	

Improving Regulations

Examine existing regulations from the perspective of hyperscale AI development and utilization (from 2023)

- Intellectual property rights
- Personal information
- Risks
- Industry-specific regulations

Establishing a New Evaluation System for Reliability and Performance

☑ Promote voluntary participation-based evaluation of the risks and performance of hyperscale AI (from 2023)

Reliability Evaluation	Performance Evaluation
Fairness (unbiased), transparency, etc.	everyday conversation, specialized knowledge (law, science, history, etc.)

Lay the foundation for becoming a digital leader by engaging public discourse across diverse societal sectors

VI Promoting AI Normalization among All Citizens

Vision

Propelling Korea
to become the global leader in AI utilization.

Goals

Addressing livelihood issues and improving the quality of people's lives

Generating extensive demand for AI and strengthening the competitiveness of the AI industry

Implementation Strategies

Citizens' Lives (Everyday Life)

We will enrich citizens' lives with AI.

- Welfare
- Health
- Childcare /Education
- Culture/Arts

Industrial Sites (Workplaces)

We will innovate industries and workplaces by integrating AI.

- Specialized Professions
- Farmers
- Small Businesses
- Enterprises

Public Administration (Public Sector)

We will establish a smart government that most effectively utilizes AI.

- Public Services
- Citizen Safety
- Administrative Tasks

Improving AI Literacy

We will proactively establish the foundation for AI normalization.

Ensuring AI Ethics and Reliability

VI Strategy 1: Enriching Citizens' Lives

Addressing societal issues and sharing digital benefits with citizens through AI

Welfare

Seniors living alone

Using AI speakers for health management at 261 nationwide health centers

At-risk households

Providing AI initial counseling service by proactively identifying at-risk households

Persons with disabilities

Offering rehabilitation and exercise coaching for the disabled, along with smart glasses for the hearing impaired

Healthcare

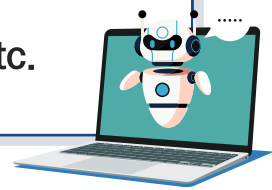
Introducing AI for disease diagnosis in public hospitals. Developing AI that predicts infectious disease spread.

Childcare, Education

Establishing a meal management system and introducing AI digital textbooks

Culture, Arts

Employing AI curator robots, digital idols, musician restoration, etc.



VI Strategy 2: Innovation in Industrial Sites and Workplaces

Leading in the integration of hyperscale AI in private sector domains

Law

Drafting litigation documents and searching legal texts

Healthcare

Creating medical records and suggesting treatment methods

Psychology

Providing mental health counseling and diagnosis

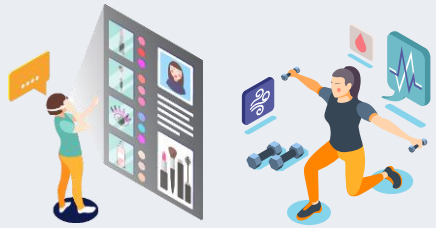
Content

Creating images, audio, etc.

Academia

Reviewing and summarizing papers

Assisting Small Businesses in Using AI



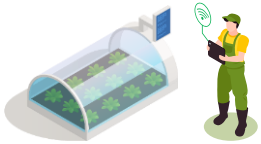
Targeting 200 service businesses like salons and fitness centers (2024)

Targeting 5,500 small business stores (2024)

Reducing the Labor Burden of Farmers and Fishermen and Promoting Healthy Food Production

Farmers

Pest diagnosis and prescription information service



Greenhouse and livestock facility management AI (by 2025)

Fishermen

Constructing smart fish farms (by 2026)

* 1 in 2023 → 6 in 2026

Accelerating the Dissemination of AI Revolutionizing Industrial Production

Developing and demonstrating AI for innovation across industries

Robotics
Automated quality control using AI-driven robots

Logistics
Order forecasts and same-day delivery

Bio, Pharmaceuticals
Discovering therapeutics and new drug candidates

Steel
Energy conservation through increased process efficiency

Materials, Chemicals
Developing AI-based new materials via raw material blending, etc.

Smart Home
Activating lighting and door locks through human voice commands

VI Strategy 3: Establishing a Smart Government that Most Effectively Utilizes AI

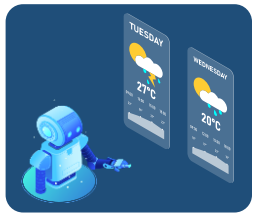
Delivering high-quality public services to citizens

Water, Food

- Constructing AI-powered water purification plants
- Analyzing and predicting the risks associated with imported food products

Weather

- Developing AI for short-term and ultra-short-term precipitation forecasts, as well as predictions for heatwaves, strong winds, and heavy rainfall



Jobs

- Offering job information and 24-hour online vocational counseling services

Administrative Inquiries

- Providing AI-powered responses for public inquiries

Ensuring citizen safety through disaster and accident response

Wildfire

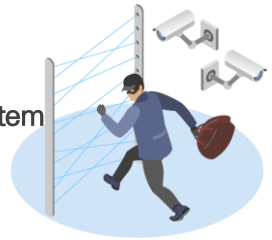
- Real-time AI-based wildfire monitoring system
  4 in 2023 ➡ 50 in 2027

Floods

- Establishing and operating an AI-based flood forecasting platform Targeting 223 locations nationwide

Intelligent Control

- AI-based intelligent control system
  32% in 2023 ➡ 100% in 2027



Report Response

- Developing a 119 report response AI platform

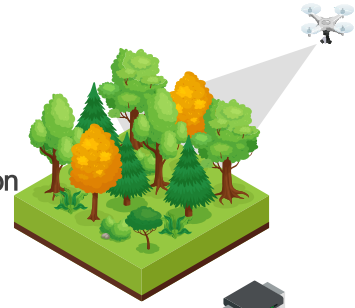
Increasing work efficiency in public organizations

Patent

Establishing and utilizing a patent-exclusive hyperscale AI language model

Forest Protection

Developing and demonstrating an AI solution for early detection and prediction of pest outbreaks



Customs

Developing and demonstrating an automated AI-based X-Ray image screening system

Statistics, Industry Classification

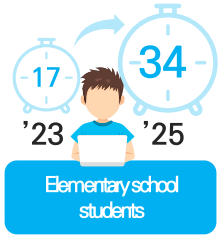
Automating national statistics classification tasks using AI

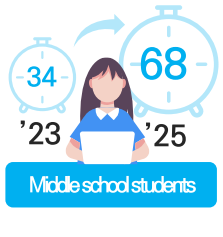
(Mapping the responded text into classification codes)

VI Strategy 4: Proactively Establishing the Foundation for AI Normalization

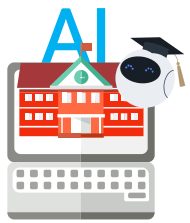
Improving AI Literacy

Conducting AI literacy education for elementary, middle, and high school students





Extending hours of IT (AI & software) classes



Operating leading AI schools

Strengthening practical AI skills for college students, job seekers, and employees

Expanding 'Software-Centric Universities' from 51 to 58

Supporting AI education and certification acquisition

Educating the general public on everyday AI products and services

Operating 226 AI Experience Zones in collaboration with local governments

Providing education on drawing, music creation, and office software using AI

Strengthening AI Ethics and Reliability

1 AI Legislation

Balanced achievement of AI industry growth and trust

▶ Supporting the establishment of the Artificial Intelligence Act

2 Reliability Testing and Certification

Supporting private-led self-regulated testing and certification systems and pilot certification (2023)

▶ Conducting testing and certification for AI in high-risk areas (2024)

3 Guidelines

Expanding reliable development guides by sector

▶ Developing tailored development guides for generative AI, high-risk areas, etc.

4 Reliability R&D

False answers (jallucination) and unethical expressions

▶ Promoting R&D to overcome AI limitations

THANK YOU