Persaingan Raksasa AI di Dunia

Apakah Indonesia Pelanduk yang Mati di Tengah-Tengah?

by Ainun Najib

Agenda

- Introduction & Objectives
- History of AI
- Major AI Players
- Geopolitical Superpowers: USA vs China
- Semiconductor Race & Sanctions
- Southeast Asia AI Landscape
- SEA-LION (Singapore)
- Indonesia's Position
- Conclusions & Recommendations

MUST WATCH: Karpathy

YouTube

Andrej Karpathy: Software Is Changing (Again)

Andrej Karpathy's keynote at AI Startup School in San Francisco. Slides provided by Andrej: https://drive.google.com/file/d/1a0h1mkwfmV2PlekxDN8isMrDA5evc4wW/view?...

Karpathy: Software 1.0, 2.0, 3.0

Software 1.0

computer code

programs

computer

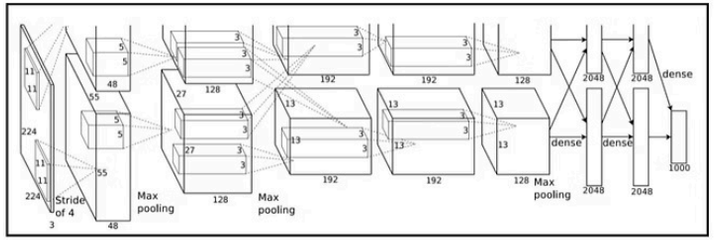
became programmable in **~1940s**

Software 2.0

weights

programs

neural net



fixed function neural net

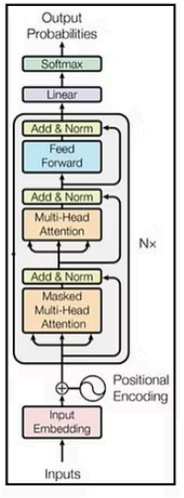
e.g. AlexNet: for image recognition (**~2012**)

Software 3.0

prompts

programs

LLM



~2019

LLM = programmable neural net!

Example: Software 1.0, 2.0, 3.0

Example: Sentiment Classification

Software 1.0

python Copy

```python
def simple_sentiment(review: str) -> str:
    """Return 'positive' or 'negative' based on a tiny keyword lexicon."""
    positive = {
        "good", "great", "excellent", "amazing", "wonderful", "fantastic",
        "awesome", "loved", "love", "like", "enjoyed", "superb", "delightful"
    }
    negative = {
        "bad", "terrible", "awful", "poor", "boring", "hate", "hated",
        "dislike", "worst", "dull", "disappointing", "mediocre"
    }

    score = 0
    for word in review.lower().split():
        w = word.strip(".,!?;:")          # crude token clean-up
        if w in positive:
            score += 1
        elif w in negative:
            score -= 1

    return "positive" if score >= 0 else "negative"
```

Software 2.0

10,000 positive examples

10,000 negative examples

encoding (e.g. bag of words)

↓ train binary classifier

parameters

Software 3.0

You are a sentiment classifier. For every review that appears between the tags
<REVIEW> … </REVIEW>, respond with **exactly one word**, either POSITIVE or NEGATIVE (all-caps, no punctuation, no extra text).

Example 1
<REVIEW>I absolutely loved this film—the characters were engaging and the ending was perfect.</REVIEW>
POSITIVE

Example 2
<REVIEW>The plot was incoherent and the acting felt forced; I regret watching it.</REVIEW>
NEGATIVE

Example 3
<REVIEW>An energetic soundtrack and solid visuals almost save it, but the story drags and the jokes fall flat.</REVIEW>
NEGATIVE

Now classify the next review.

Origins of AI

1

1956

Dartmouth Conference: birth of "Artificial Intelligence"

2

1960s–70s

Rule-based expert systems (DENDRAL, MYCIN)

3

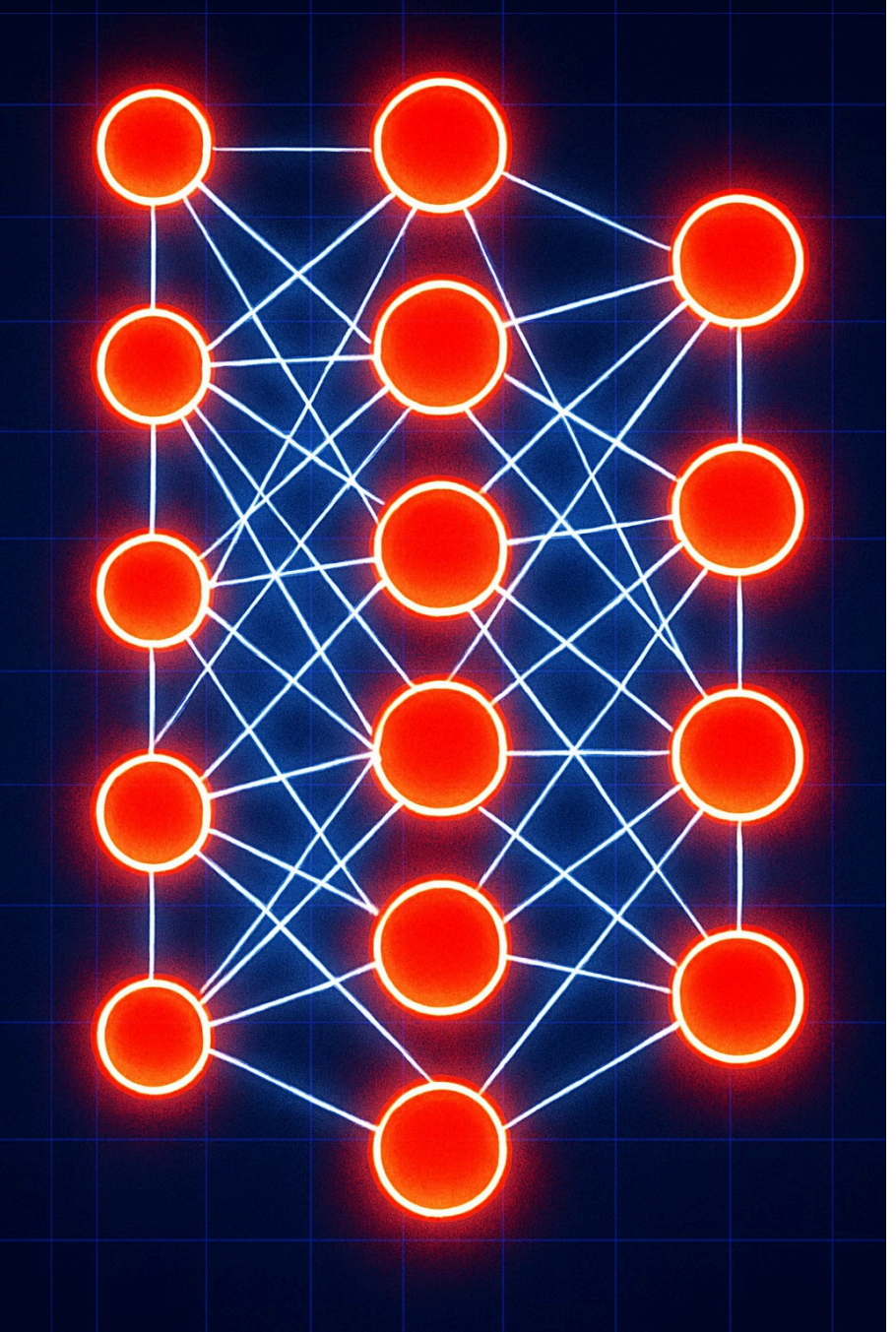
1980s

Early machine learning algorithms emerge

4

1997

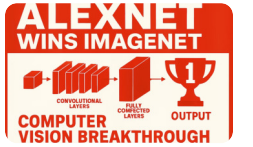
IBM Deep Blue beats Kasparov



Rise of ML & Deep Learning

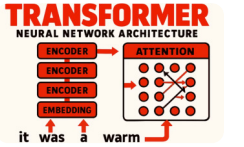
2000s

Statistical learning and big data



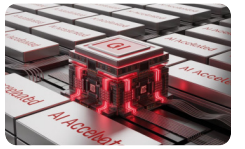
2012

AlexNet wins ImageNet, deep learning breakthrough



2015-2020

Transformer architectures revolutionize NLP



2020+

GPUs and cloud computing unlock scale

Three Pillars of AI Dominance

AI Talent Pool

Nations must cultivate and attract world-class researchers and engineers capable of developing cutting-edge algorithms and systems.

- Universities producing ML/AI graduates
- Research institutions fostering innovation
- Ability to attract global talent

Massive Compute Infrastructure

Training frontier AI models requires unprecedented computational resources accessible at scale.

- Supercomputing clusters
- Cloud computing capacity
- Data centre networks

Semiconductor & Energy Supply

Access to advanced chips and sustainable energy sources creates the foundation for AI development.

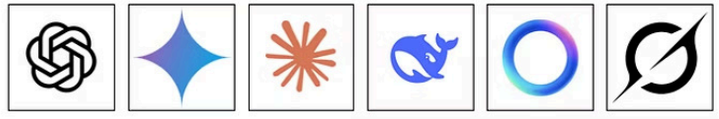
- Advanced GPU/TPU production
- Reliable energy infrastructure
- Sustainable power solutions

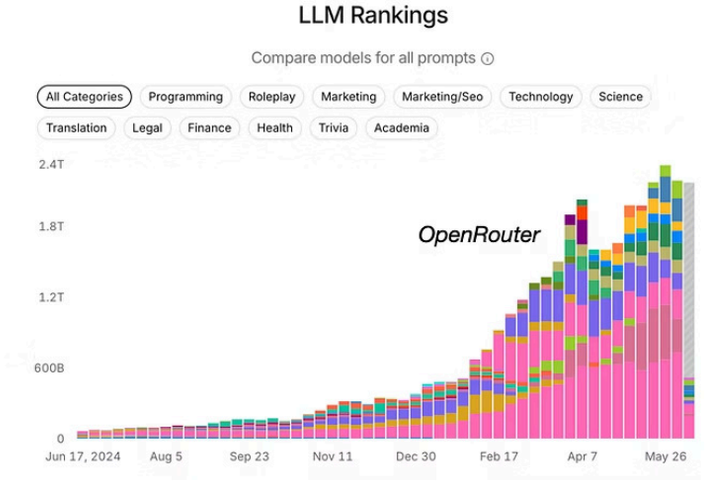
Countries that excel across these three dimensions gain significant advantages in the global AI race, creating barriers to entry for emerging players.

Karpathy: AI ~ Electricity, LLMs ~ utilities

LLMs have properties of utilities...

- CAPEX to train an LLM (~= to build the grid)
- OPEX to serve intelligence over increasingly homogeneous API (prompt, image, tools, ...)
- Metered access ($/1M tokens)
- Demand for low latency, high uptime, consistent quality (~= demanding consistent voltage from grid)
- OpenRouter ~= Transfer Switch (grid, solar, battery, generator...)
- Intelligence "brownouts" e.g. when OpenAI goes down.





Emergence of Global AI Giants

Google

DeepMind, Brain

Amazon

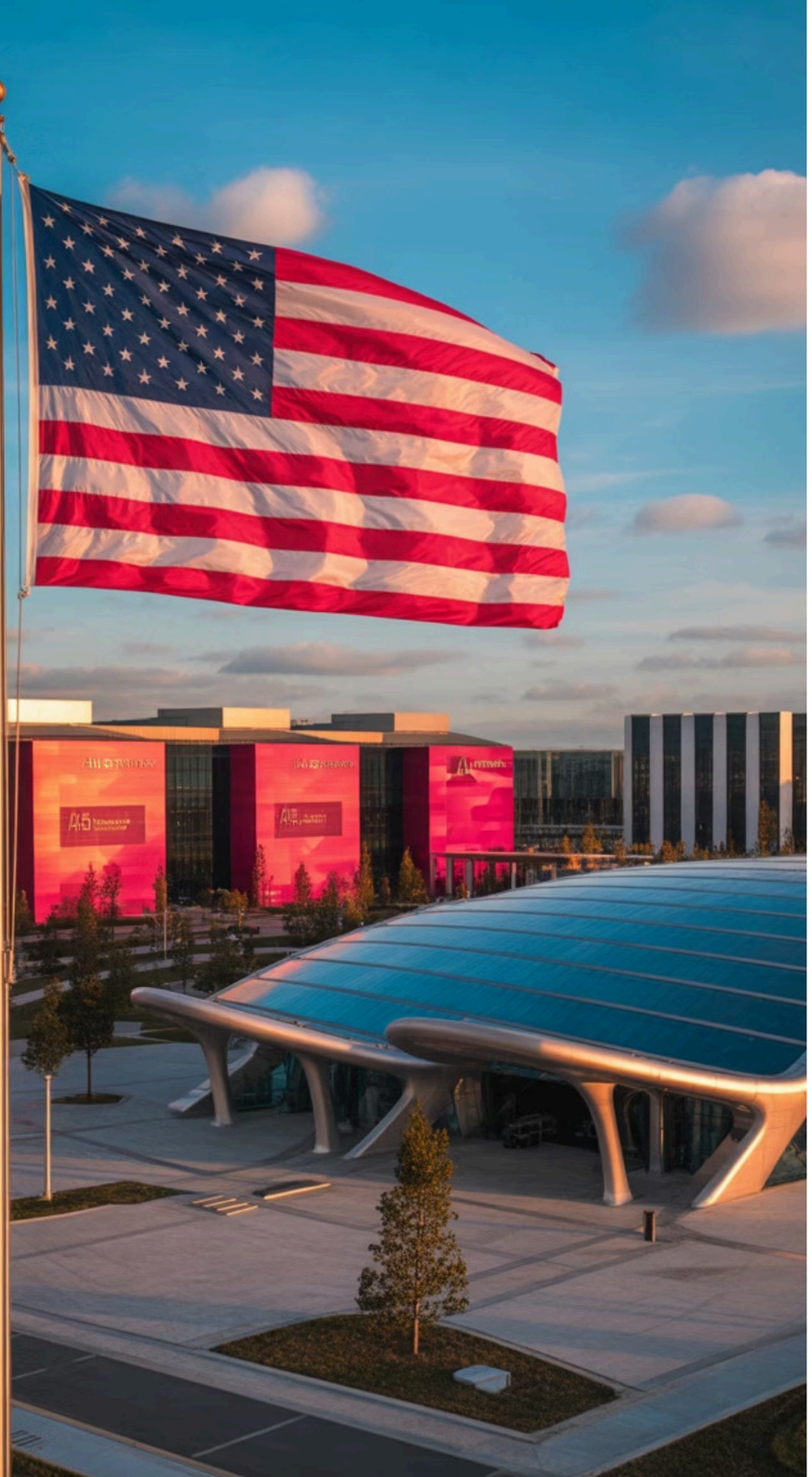
AWS AI services

Microsoft

Azure AI, OpenAI partnership

Facebook/Meta

AI research labs



USA's AI Flagbearers

OpenAI

GPT series, ChatGPT

Google DeepMind

AlphaGo, AlphaFold

Microsoft Azure AI

Cognitive Services

NVIDIA

GPU leadership

China's AI Champions

Baidu

Ernie, Apollo

Alibaba

AliMe, PAI

Tencent

Hunyuan, AI Lab

Huawei

MindSpore, Ascend chips

Geopolitical AI Superpowers

USA vs China

Tech rivalry becomes national strategy

Talent race

Migration and brain-gain/drain

Strategic sectors

Defense, finance, healthcare

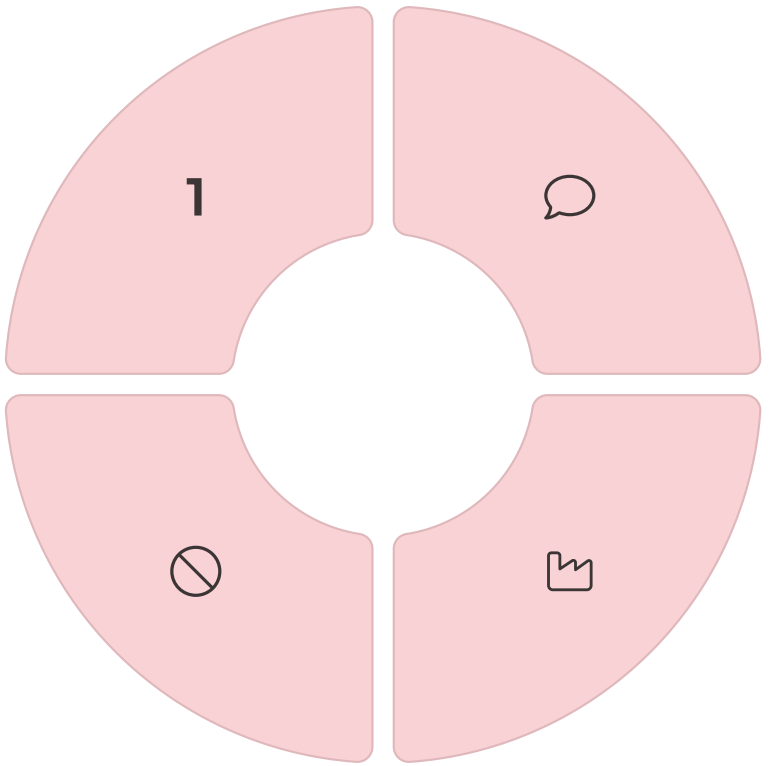
Governance

Who sets the rules?

Semiconductor Race

TSMC & Samsung

Leading edge fabs



NVIDIA & AMD

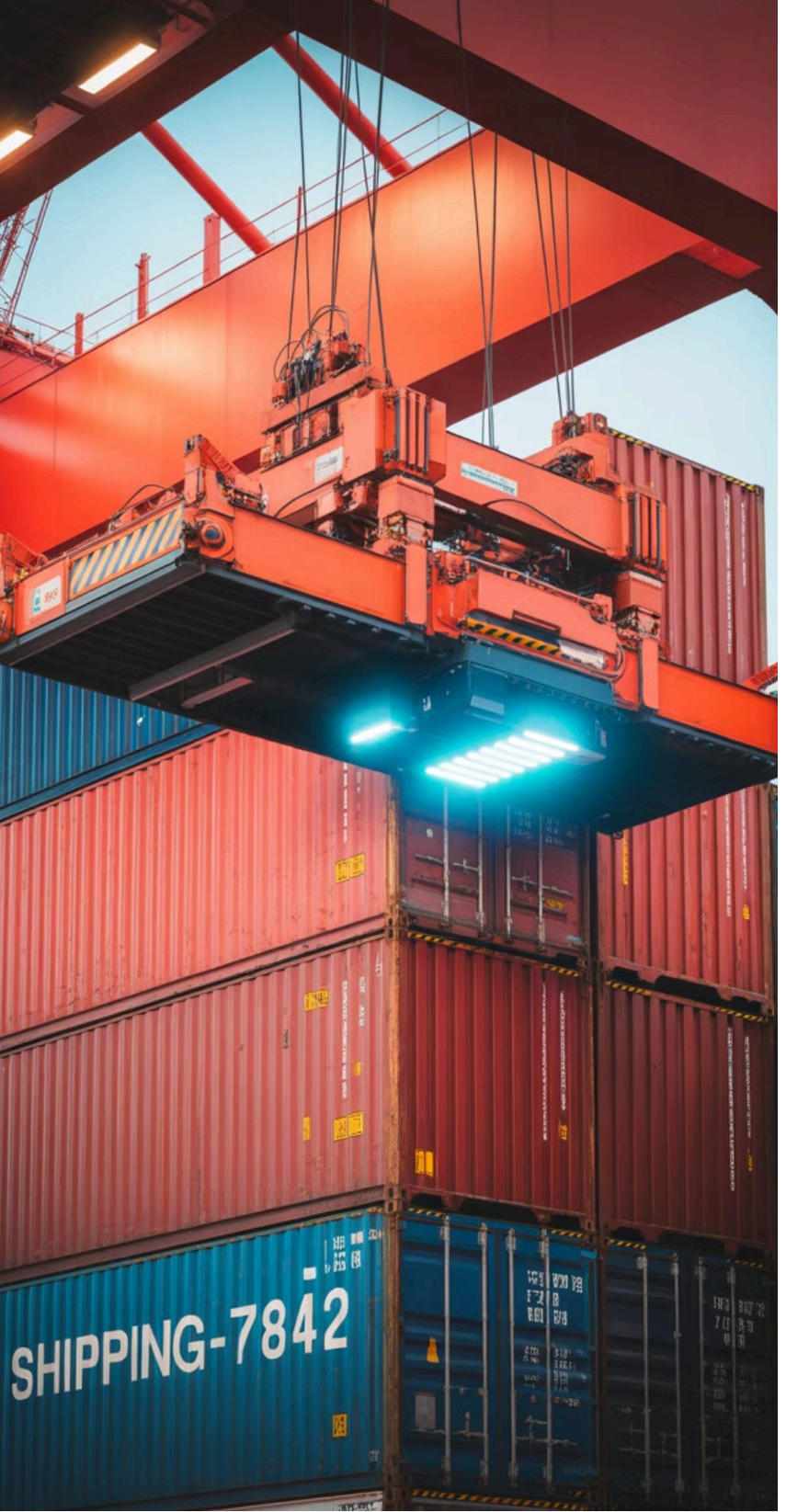
GPU innovation

US export controls

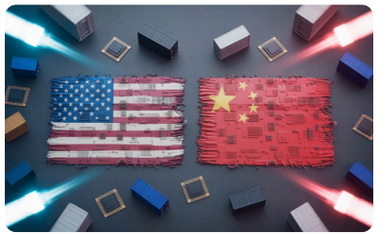
Restrictions on advanced chips

SMIC & Chinese fabs

Catching up under sanctions



Impact of Sanctions



US restrictions

Targeting Huawei & SMIC with export controls, limiting access to advanced semiconductor technology

China's response

Aggressive push for domestic chip self-sufficiency and technological independence

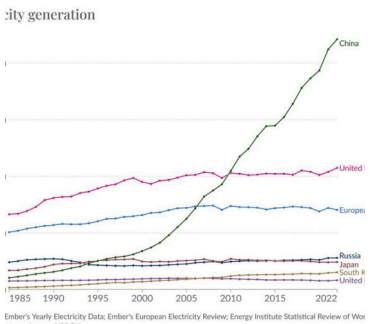
Global impact

Significant supply-chain disruptions affecting technology companies worldwide

AI consequences

Reduced compute availability hampering development of advanced AI systems

Energy Race



Twitter

Christian Keil on Twitter / X

Over the last 20 years, China's electricity generation has grown from half to...

Twitter

Jesse Peltan on Twitter / X

China is winning the race to Type 1 Civilization and we're not even aware it's happening.By 2030, China will have the manufacturing...

Southeast Asia AI Landscape

Growing adoption

Finance, e-commerce, govtech

Talent dynamics

Hubs vs capacity gaps

Regional strategies

Indonesia, Singapore, Malaysia, Thailand, Vietnam

Regulatory landscape

Cross-border data challenges

Singapore's SEA-LION Model

National AI Strategy

Developed by AI Singapore

Region-specific

Lightweight language model

Applications

SME support, public sector pilots

Collaboration

Universities & startups

Indonesia?

Komdigi Sebut Indonesia Bakal Buat AI Sendiri: Berkaca ke Negara Tetangga

Nikita Rosa - detikEdu

Jumat, 27 Jun 2025 10:00 WIB

Ilustrasi AI. Foto: Getty Images/Supatman

Jakarta - Kementerian Komunikasi dan Digital (Komdigi) mengatakan pihaknya sedang mengembangkan Artificial Intelligence (AI) sendiri. Akan seperti apa?

Sebelumnya, pernyataan tersebut disampaikan oleh Sonny Hendra Sudaryana selaku Direktur Pengembangan Ekosistem Digital Komdigi pada Studium Generale dalam Rangkaian Dies Natalis ke-10 Fakultas Ilmu Administrasi Universitas Indonesia di Balai Purnomo, Kampus UI, Depok, Jawa Barat, Kamis (26/6/2025).

Saat ditanya mengenai apakah Indonesia akan membuat AI sendiri, Sonny mengatakan jika Komdigi sedang mengarah ke sana.

Indonesia's Current AI Status

No national AI model

Unlike Singapore's SEA-LION

Fragmented initiatives

Private sector, Govt, Universities working separately

Talent gap

University output vs industry demand

Regulatory framework

Still in discussion phase

Challenges & Opportunities

Challenges

- No central strategy
- Limited funding
- Infrastructure gaps

Opportunities

- Large market
- Bahasa Indonesia & bahasa daerah corpus datasets
- Diaspora talent
- Public-private partnerships

Conclusions & Recommendations

Define AI roadmap

Urgent national priority

Model strategy

National model or SEA-LION consortium

Infrastructure

Strengthen chip access partnerships

Local advantage

Leverage Bahasa language/data

Alignment

Government, academia, industry cooperation

Bonus slide: Why is Now special?