

Artificial Intelligence and Strategic Choices of Small States: Locating the Real Decisions

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Data
Systems
Group

About me...

- University Professor @ Waterloo
- Research: data science with data engineering focus
- Co-director of Math Data Science & AI Program
- Fellow of Royal Society of Canada, American Association for the Advancement of Science, Balsillie School of International Affairs
- Life Fellow of IEEE and ACM
- Canadian & Turkish; educated at METU and Ohio State



My thesis...

For small states, AI strategy is not a question of whether to build at the frontier — it is a question of where in the stack to locate effort.

Small states cannot build foundation models. They can build everything that determines whether AI produces value on top of them.

Where do small states have strategic agency in AI?

The standard framing:

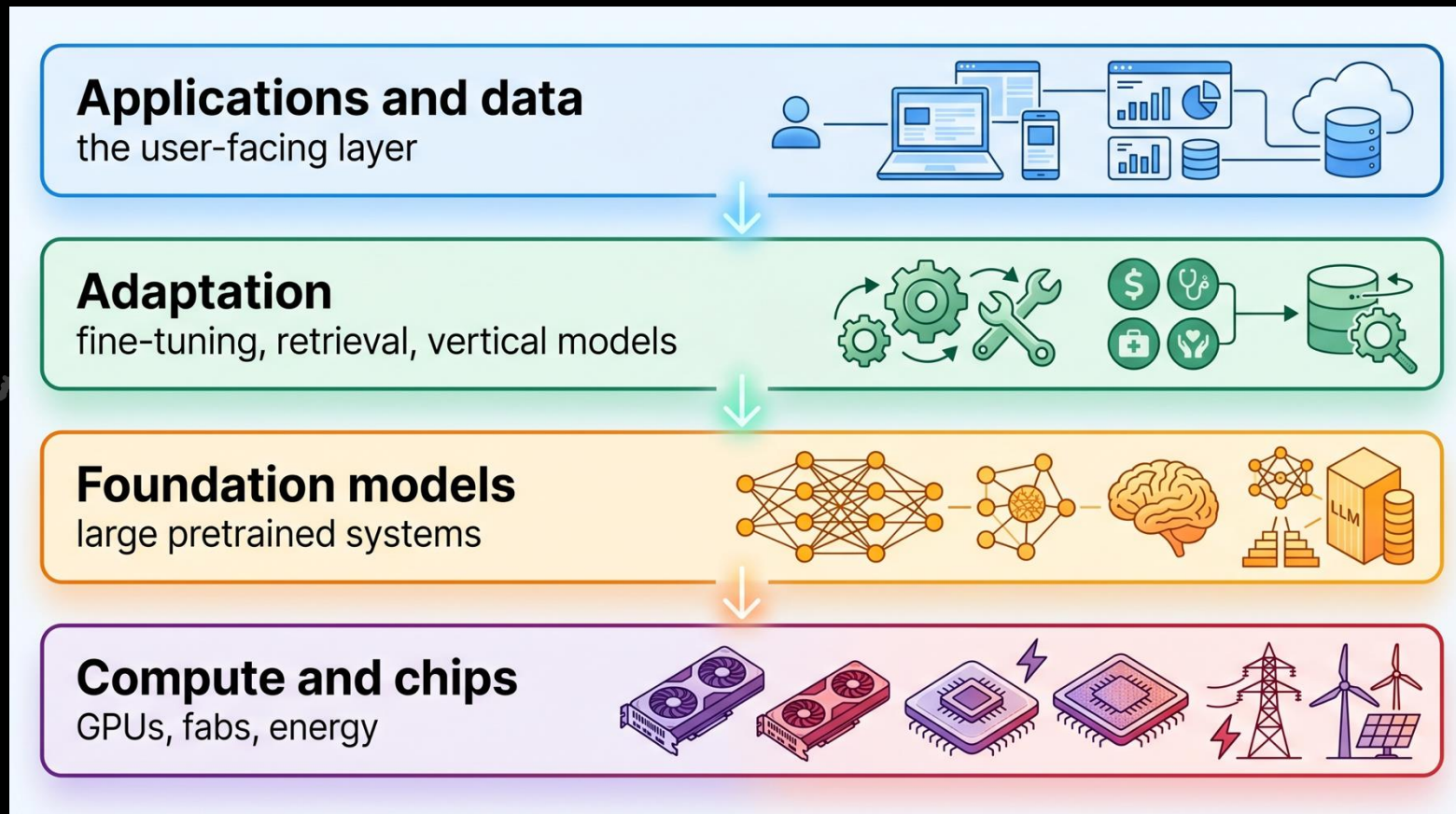
Adopt foreign AI
or
Build national AI

This framing is too crude

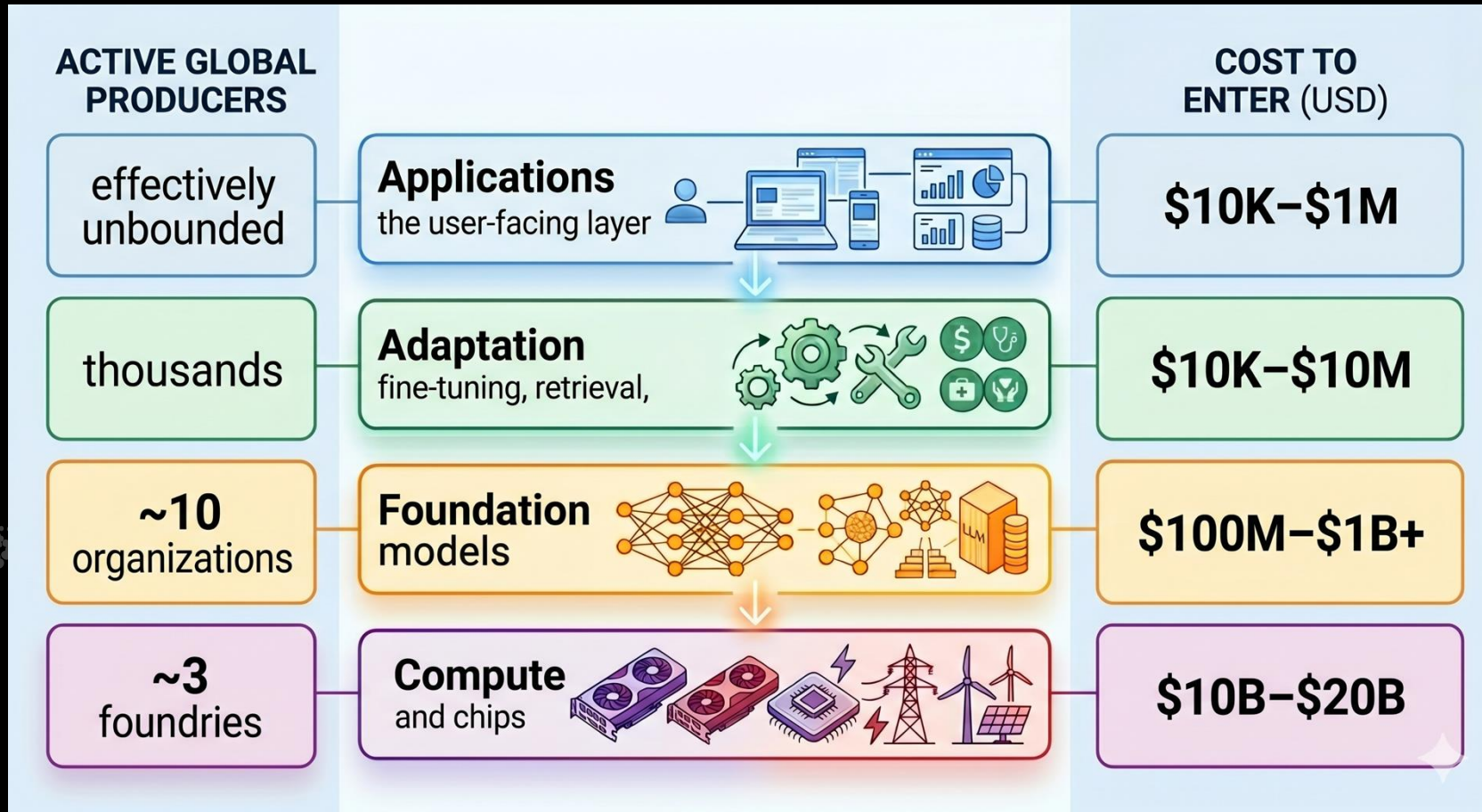


The AI Stack

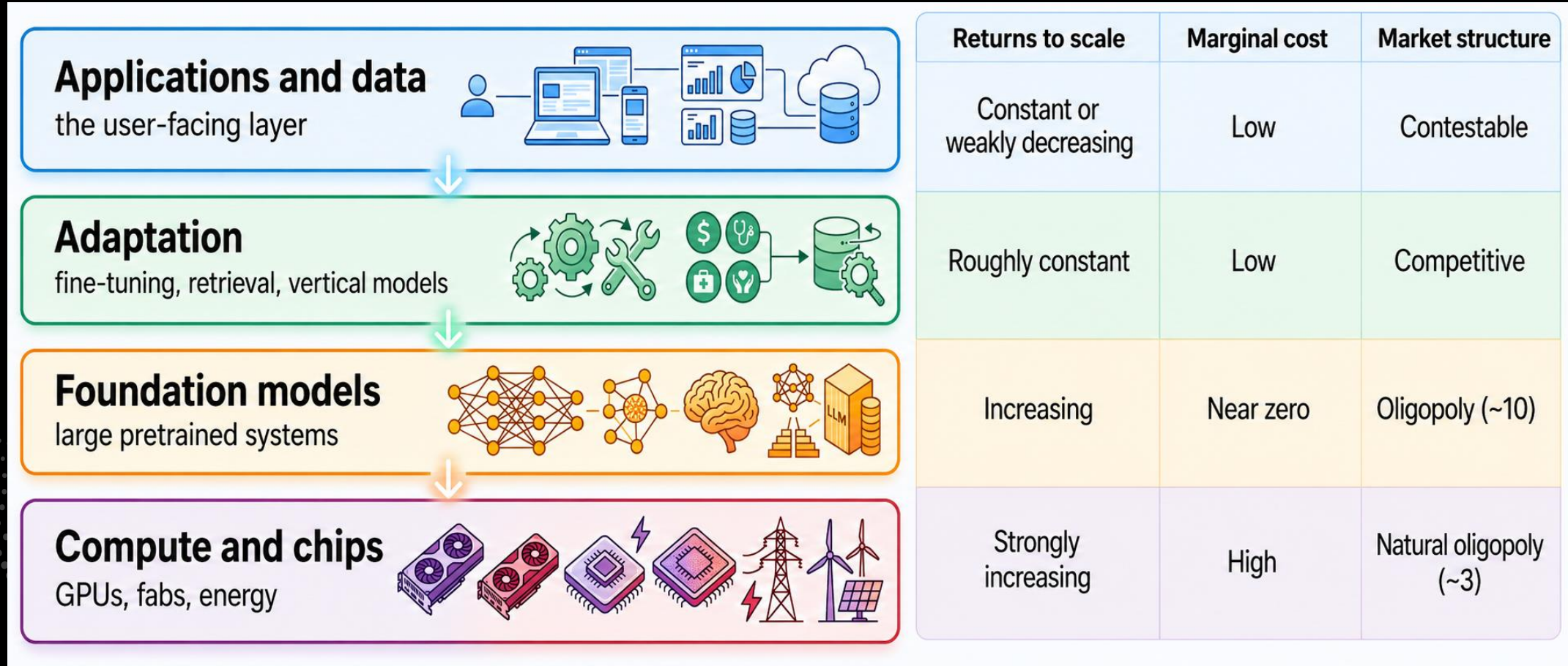
AI is a stack, not a monolith



The Economics by Layer

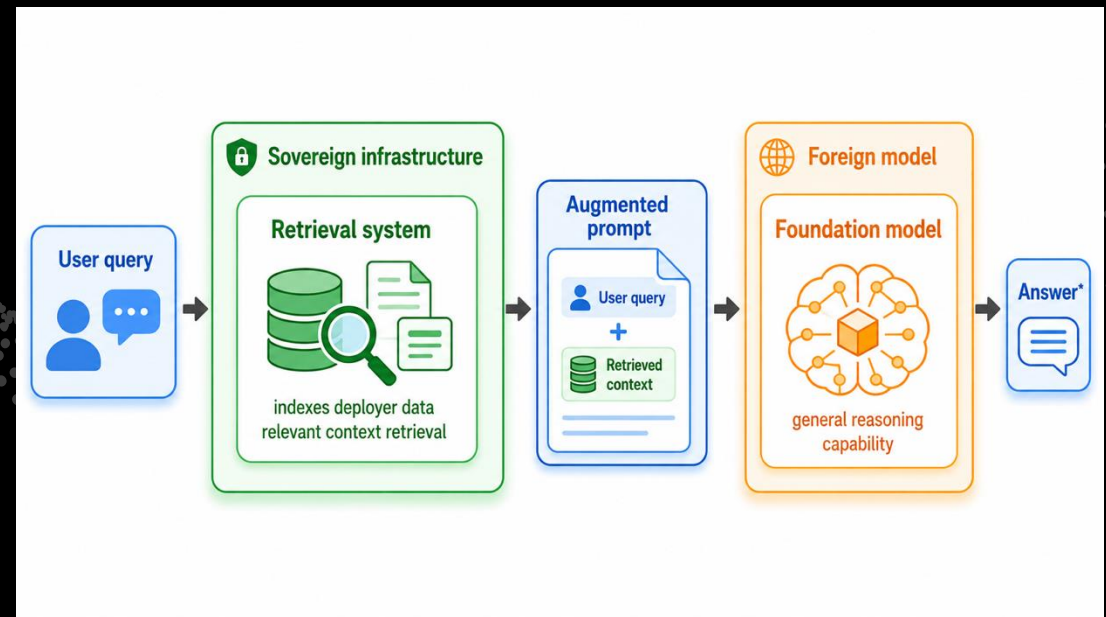


Returns-to-scale by layer



Retrieval-augmented generation (RAG)

- **Foundation model** — general reasoning capability (typically foreign)
- **Retrieval system** — indexes the deployer's data, returns relevant context (sovereign)
- **Combined at inference time** — the model reasons over your data without ever training on it
- **Sovereign data + carefully governed model access** = practical sovereignty without national training runs



Asymmetry I: Data

Data: a quality argument not a volume argument

Small states have less data — but can curate higher quality

Provenance, integration, governance are real moats

Estonia's X-Road: an architecture, not a model

Singapore: TradeNet (1989), Singpass, the National AI Strategy's data pillar

“Sovereign data” is a more realistic ambition than “sovereign compute”

Asymmetry II: Policy

Policy: small states can move faster

Singapore: Model AI Governance Framework, iteratively revised (2019–)

UAE: Minister of State for AI since 2017 — first such appointment globally

Estonia: experimentation with algorithmic decision-making in government

Compare: the EU AI Act, a multi-year compromise

Regulatory clarity is itself a competitive asset

Asymmetry III: Specialization

Specialization: niche dominance beats broad mediocrity

Estonia — govtech and digital identity

Finland — industrial AI and AI literacy (first in EU, 2017; “Elements of AI”)

Switzerland — finance-grade AI (EPFL/ETH research base)

Singapore — smart-city, port logistics, financial AI

The question is not “do AI”; it is “what is our vertical?”

Three strategic postures

Adapter

Consume frontier AI; focus on integration and value capture

Specializer

Build vertical capability where comparative advantage exists

Coordinator

Hub for governance, standards, dispute resolution

Most states need a mix

Failure mode: pretending to be a Builder at the foundation layer

Three illusions to avoid

The sovereignty illusion

A national LLM is not sovereignty if compute, chips, and energy are imported

The talent paradox

The more AI-capable your workforce, the more globally mobile it becomes

The data trap

Applications built on foreign foundation models export your data as a byproduct

Implications for smaller states

Infrastructure over headlines: interoperability, national data architecture

Regulatory clarity reduces uncertainty for adopters and investors alike

Talent ecosystem: retention as much as training

The Coordinator role: where AI compounds an existing advantage

Closing: the Middle Corridor

The Middle Corridor is not a foundation-model project

It is infrastructure where AI-enabled coordination, prediction, and customs automation compound an existing geographic advantage.

The strategy belongs where the advantage already lives