

# The AI Sovereignty Imperative

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As artificial intelligence becomes the primary driver of innovation, productivity, and scientific discovery, compute infrastructure has emerged as a strategic resource—on par with oil in the 20th century or electricity in the early industrial age. The age of AI is, fundamentally, the age of compute. Models are growing in size, complexity, and capability.

Training them requires unprecedented levels of processing power, specialised hardware, and sustained infrastructure investment. Yet the availability of compute—and a nation's ability to control, direct, and scale it—is rapidly becoming a key determinant of competitiveness, autonomy, and national relevance.

## The Competitive Compute Gap

Nations that fail to build and maintain sufficient compute infrastructure risk falling into a long-term trap of scientific and economic irrelevance. Access to cutting-edge AI capabilities is becoming synonymous with the ability to conduct meaningful research and development. From fundamental science to product design, from logistics optimisation to climate modelling, modern R&D is now inextricably linked with AI-augmented methodologies. If a country cannot access or build large-scale AI systems, it cannot participate fully in the next generation of innovation. Its researchers will fall behind. Its universities will be constrained. Its companies will depend on foreign platforms, often at high cost and under strategic vulnerabilities.

This is not only an academic problem. In the emerging global economy, all services—from healthcare and law to education, transportation, and finance—are being restructured around AI-assisted delivery. For instance, doctors in many systems will increasingly rely on AI triage and diagnosis tools. Educators will use AI tutors to personalise learning. Legal systems will employ AI to streamline case preparation. These systems run on compute. The faster, cheaper, and more locally available it is, the more a country can deploy these technologies equitably and securely across its society.

## Public Sector Transformation and AI Sovereignty

Governments are not exempt. Public services—from tax collection and benefits processing to emergency response—stand to be transformed through AI. With AI, the state can offer radically more efficient, personalised, and dynamic public services. But to do so, it must have guaranteed sovereign access to advanced AI systems and their compute backbones.

Here arises the critical notion of AI sovereignty: the capacity of a nation to independently train, run, adapt, and secure its own AI systems. Sovereignty in the AI era does not just mean having a domestic tech sector. It means being able to allocate compute strategically across national priorities—security, science, welfare, economic development—without foreign dependencies or vulnerabilities. Without AI sovereignty, a country is effectively operating in a rented cognitive infrastructure, exposed to price shocks, access restrictions, or even backdoor manipulation.

## Comparative Advantage in the Age of Compute

Some argue that the global economy will still allow for specialization—under Ricardo’s principle of comparative advantage. That may hold true, but the axis of specialization is shifting. The question is no longer just “what industries do we have a comparative advantage in,” but “what do we choose to allocate our compute capacity toward?”

In this framework, compute becomes a finite, allocable national resource, not unlike energy or water. Nations will differ not just in how much compute they possess, but how wisely and strategically they deploy it. A bioengineering powerhouse may direct compute to protein folding and synthetic biology. A financial hub may channel it into real-time macroeconomic modeling. A defense-oriented nation may use it for autonomous surveillance, cyber capabilities, and tactical AI. These choices will shape national development paths and industrial profiles for decades.

## AI as the New Driver of Science

Perhaps the most transformative consequence of this compute revolution lies in the reimagination of science itself. The classic model of human-led hypothesis generation and testing is giving way to AI-driven discovery. Large models are starting to be able to propose experiments, simulate outcomes, and refine theories with minimal human intervention. What emerges is a new vision of science—not as a set of disciplines practiced by people, but as Lakatosian research programmes orchestrated and accelerated by machines.

As these programmes unfold, a bifurcation may occur. Countries or organisations with early access to powerful models and compute will chart radically different scientific trajectories. In less than a decade, the tools, techniques, and discoveries available to AI-rich societies may appear indistinguishable from “magic” to others—reminiscent of Clarke’s famous adage. This is not science fiction. We already see early signs in biotech, material discovery, and defense R&D, where machine learning models outperform entire labs of human experts.

## From Human Capital to Model Trajectories

Crucially, the intellectual property of the future will not reside in patents, published papers, or even institutional know-how. It will live in model memory—in the internal representations, embeddings, and trajectories of AI systems trained on vast swathes of domain knowledge and interaction. The new “intellectual elite” will be those who control, understand, and steer the fine-tuning and evolution of large models. IP will become path-dependent: a function of training data, model updates, and reinforcement feedback loops. Owning and curating the journey of a model may be more important than owning any particular invention it generates.

In such a paradigm, the locus of innovation shifts from human minds to computational substrates. This does not devalue human capital—but it redefines it. The critical skillsets of the future will revolve around AI alignment, model governance, compute orchestration, and strategic data acquisition. Nations that do not invest in these domains will increasingly become consumers, not creators, of next-generation knowledge.

## A Call for Strategic Investment

All of this points to a pressing imperative: the strategic national investment in compute infrastructure, AI expertise, and sovereign capability. Just as Cold War-era powers invested massively in space programs or nuclear deterrents, today’s leading economies must consider devoting a significant share of GDP—perhaps 4% or more—to building a national compute backbone.

This includes physical infrastructure (data centres, cooling systems, advanced chips), organisational capacity (AI research labs, national AI clouds, public-private partnerships), and talent pipelines (education, fellowships, and international recruitment). It must also include regulatory and ethical oversight, ensuring that AI systems are aligned with national values and serve the public interest.

Failing to act decisively now risks permanent dependency. The world is approaching a divergence point: a moment when state-of-the-art models become so advanced and path-locked that catching up becomes effectively impossible without having participated in their formative phases. For many countries, the 2020s-2030s will be the last chance to secure a stake in the AI future.