America Has Outrun Its Understanding of Technology

written by Jack Lifton | August 24, 2026

As I read the headlines in the popular press—and, increasingly, in the trade press—about artificial intelligence, Pax Silica, Project Vault, critical minerals, semiconductor independence, and the restoration of American manufacturing, I am struck by a disturbing conclusion.

Our society is attempting to manage technologies that its principal decision makers do not understand.

Journalists frequently do not understand the technologies they are describing. Government bureaucrats and lawmakers often understand them even less. Yet these are the people explaining the technological future to the public, allocating public money, establishing industrial policy, and determining which projects will be supported in the name of national security.

The problem is not simply scientific illiteracy. No senator, civil servant, or financial journalist can reasonably be expected to understand semiconductor fabrication, artificial intelligence, metallurgy, electrical generation, mineral processing, and advanced manufacturing in technical detail.

The problem is that they do not seem to understand that these technologies are physical industrial systems. They speak about them as though they were merely ideas that can be summoned into existence by legislation, subsidies, loan guarantees, press releases, and vast quantities of other people's money.

Artificial Intelligence Is the Most Obvious Example

AI is routinely discussed as software: an almost disembodied intelligence residing somewhere in “the cloud.” But the cloud is not in the sky. It is an enormous collection of buildings filled with semiconductor devices, copper wiring, cooling systems, transformers, power electronics, backup generators, and communications equipment.

Every one of these components must be manufactured from materials that must first be mined, refined, purified, converted into useful forms, fabricated into components, qualified by customers, and delivered in enormous quantities with extraordinary consistency.

An AI data center does not run on venture capital or political enthusiasm. It runs on electricity.

That electricity must be generated somewhere. It must be transmitted through a grid. Transformers must be available to change its voltage. Copper or aluminum must carry it. Cooling systems must remove the heat. Semiconductor fabrication plants must produce the processors and memory devices. Chemical companies must provide gases, photoresists, polishing compounds, and ultrapure reagents. Manufacturers must build servers, connectors, cables, switches, and power control systems.

Even the most advanced AI program remains useless until the physical economy provides all of these things. Yet the public discussion generally begins with the finished technology and works backward only far enough to reach the next headline.

Washington says that America will lead in AI. Very well. How much additional electrical generating capacity will be required?

Where will it come from? How many transformers will be needed? Who will manufacture them? Where will the electrical steel, copper, and insulating materials come from? How many new semiconductor fabrication plants are economically justified, and who possesses the skilled workforce required to operate them?

These Are Not Secondary Questions. They Are the Questions.

Pax Silica illustrates both an awareness of the problem and the persistence of the same intellectual weakness. The State Department describes Pax Silica as its flagship AI and supply chain security initiative, covering semiconductors, advanced manufacturing, logistics, energy, mineral refining, and processing. In other words, the initiative at least acknowledges that an AI economy requires an entire industrial stack, not merely algorithms and data centers.

But acknowledging the existence of a supply chain is not the same as understanding how one works.

A diplomatic declaration cannot manufacture a semiconductor. An alliance does not automatically create an economically viable refinery. A list of “trusted partners” does not tell us which partner can perform each required step, at what scale, at what cost, to what specification, and on what schedule.

If Pax Silica is to become more than a political slogan, it must be reduced to a detailed industrial balance sheet. What materials are required? In what chemical and physical forms? Who produces them now? Where are the bottlenecks? Which capacities can be expanded economically? Which products have already been qualified by end users? Where are the engineers, operators, toolmakers, metallurgists, chemists, and technicians who will do the work?

Until those questions are answered, the “full stack” remains a phrase rather than a supply chain.

Project Vault presents the same danger in another form. The administration describes it as a strategic critical minerals reserve for American businesses, and a subsequent executive order identifies the U.S. Strategic Critical Minerals Reserve as Project Vault.

A reserve can be useful. It can provide temporary protection against interruption. It can give manufacturers time to adjust to a supply crisis. It can smooth an emergency shortage. But a stockpile is an inventory, not an industry.

Possessing a mineral concentrate does not mean that the United States can separate it. Possessing a separated oxide does not mean that it can be reduced economically to metal. Possessing metal does not mean that it can be converted into the correct alloy. Possessing an alloy does not mean that it can be fabricated into a qualified component. And possessing a qualified component in a warehouse does not mean that there is enough replacement production capacity to replenish it after it has been consumed.

The crucial distinction—one that Washington repeatedly misses—is the distinction between having material and having capability.

Material can be purchased. Capability must be developed, demonstrated, operated, maintained, and continuously improved. It resides in people, equipment, production history, quality control systems, customer relationships, and accumulated industrial knowledge.

A strategic reserve may buy time. It cannot manufacture the future.

The deeper issue is that our political and financial institutions have come to believe that money is a substitute for knowledge. If a technological or industrial problem is sufficiently important, they assume that allocating enough billions of dollars will solve it.

Money is Necessary, But it is Not Sufficient

Money cannot instantly produce an experienced separation plant operator. It cannot recreate a metallurgical tradition that disappeared when an industry was sent abroad. It cannot compress ten years of pilot work, customer qualification, production debugging, and process improvement into eighteen months. It cannot repeal thermodynamics. It cannot transform a subeconomic deposit into an economic one merely by relabeling it “critical.”

Most importantly, money cannot supply judgment to people who do not know which questions to ask.

This failure is being amplified by the structure of modern journalism. Reporters face pressure to explain complicated industrial developments quickly. They naturally depend upon statements from governments, promoters, consultants, and publicly traded companies. The result is an echo chamber in which an announcement becomes a plan, a plan becomes a project, a project becomes production, and prospective production is reported as though it were already a secure supply chain.

The distance between a press release and commercial production has largely disappeared from the public narrative.

That would be merely irritating if the consequences were confined to financial speculation. They are not.

We are making fundamental decisions about energy, employment, defense, education, trade, and national security based on descriptions that are often technologically incomplete and economically unrealistic.

We are also deploying technologies whose social consequences we have barely begun to consider.

AI may increase productivity, accelerate scientific research, improve medical diagnosis, and reduce the cost of many professional services. It may also eliminate or diminish broad categories of employment, concentrate economic power in a small number of technology and energy companies, and reduce the value society places upon human experience and judgment.

What happens to a society when entry level intellectual work is increasingly performed by machines? How does a young person acquire judgment without first performing the routine work through which judgment has traditionally been developed? If machines draft reports, analyze data, write software, and increasingly recommend decisions, where will the next generation of experienced professionals come from?

We already face a shortage of engineers, metallurgists, chemists, skilled technicians, and experienced industrial managers. We now seem determined to create a world in which fewer people understand how the systems upon which they depend actually work.

This is not progress unless we know how to manage it.

The industrial technologies of the twentieth century transformed standards of living, but they did so through the widespread creation of productive employment. Modern technological development may produce enormous wealth while concentrating ownership and reducing the need for human labor. That could alter not only our economy but our societal composition: who works, who owns, who decides, and who remains economically relevant.

I do not believe that our political institutions have seriously considered this possibility. They are still measuring technological success by investment announcements, market capitalization, and the number of proposed data centers.

We Need a Different Kind of Technological Policy

Before subsidizing a project, the government should conduct capability due diligence. It should identify the product actually required by the end user, the complete chain of transformations necessary to manufacture it, the personnel capable of operating each step, the realistic capital and operating costs, the qualification requirements, and the customer prepared to buy the output.

Before announcing an industrial alliance, the participants should prepare a physical supply chain map showing where each essential material, component, process, and skill is located.

Before building an AI future, the United States should determine whether it can provide the electricity, grid equipment, raw materials, manufactured components, and trained workforce that future requires without degrading the standard of living of everyone else.

And before celebrating the displacement of human work, we should decide what economic and social role displaced human beings are expected to occupy.

The danger is not that technology is advancing too rapidly. The danger is that our capacity to understand, govern, and economically integrate technology is advancing too slowly.

We have overreached—not necessarily the limits of science, but the limits of institutional competence.

A civilization can use technologies that only a small number of specialists fully understand. It cannot safely reorganize its economy and society around technologies that its lawmakers, bureaucrats, journalists, financiers, and citizens understand only as slogans.

Technology does not relieve us of the obligation to think. It makes that obligation more urgent.

Unless we restore technological literacy, industrial experience, and informed judgment to public policy, we will continue to announce futures that we lack the physical capability to build—and may discover, too late, that we never understood the future we were creating.