

ENGINEERED BUSINESS PERFORMANCE (EBP): A NATIONAL CAPABILITY FOR ECONOMIC DEVELOPMENT, HUMAN ADVANCEMENT, AND AMERICAN COMPETITIVENESS

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ABSTRACT

The United States is entering an AI-accelerated economic era in which idea generation, prototyping, and early-stage innovation are expanding faster than the nation's ability to commercialize them. While AI increases worker productivity by 14–40% and reduces early-stage development time by 40–60%, the U.S. ranks 32nd globally in skills adaptability, signaling a widening gap between technological potential and national capability. This paper argues that the root cause of early-stage failure—representing \$400B in annual lost value—is not entrepreneurial weakness but a systemic absence of commercialization literacy: the ability to understand feasibility, incentives, friction, adoption psychology, systems design, and pathway selection. The solution considered here is a modernization of American education similar in spirit to the earlier expansion of STEM capability. Other regions, including Singapore, South Korea, Japan, and Brazil, have already integrated innovation literacy and systems-based problem solving into national curricula, positioning commercialization capability as a strategic asset. By reducing early-stage failure by even 10–30%, the U.S. could recover \$40B–\$120B annually, generate up to 400,000 jobs, strengthen strategic sectors, and expand long-term GDP by more than \$1T. In an AI-driven global economy, commercialization literacy offers a way to understand how nations convert technological potential into economic strength. This paper outlines a lightweight national infrastructure—leveraging EDA, OCTAE, and universities—that could support broader capability development.

INTRODUCTION — AMERICA NEEDS A NEW WAY OF THINKING

America is entering a new economic era—one defined by AI, advanced manufacturing, biotech, aerospace, cybersecurity, and deep-tech innovation. Yet national capability has not kept pace with the complexity of the systems now shaping economic outcomes.

Students feel disconnected from the economy.

Workers feel vulnerable to exploitation.

Innovators face opaque commercialization pathways.

Regions struggle to convert innovation into economic growth.

National competitiveness is slipping.

According to the World Economic Forum's Global Competitiveness Index, the United States ranks 32nd globally in “skills adaptability,” a metric directly tied to commercialization capability and innovation readiness.

This paper examines commercialization literacy as a potential national capability that may help modernize how Americans understand innovation, value creation, and economic participation.

This is not presented as a new discipline.

It is framed as a modernization of existing educational and economic development approaches—similar in spirit to the earlier expansion of STEM capability.

THE ROOT CAUSE OF EARLY-STAGE FAILURE IS NOT FAILURE — IT IS BLINDNESS

Early-stage failure destroys \$400B annually in the United States.

- 70–90% of startups fail
- 50–60% fail before product-market fit
- 42% fail due to “no market need”
- 29% fail due to running out of cash
- 23% fail due to team issues

These are surface symptoms.

The underlying issue is a lack of understanding—specifically, a gap in commercialization literacy.

People fail because they cannot see the system they are entering.

They lack feasibility judgment, incentive awareness, friction recognition, pathway selection logic, capability-terrain alignment, behavioral adoption modeling, and systems-design literacy.

These are not entrepreneurship skills.

These are economic participation skills—and they are rarely taught.

THE SOLUTION IS SURPRISINGLY SIMPLE — MODERNIZE EDUCATION THE SAME WAY WE MODERNIZED STEM

Early-stage failure, workforce gaps, innovation bottlenecks, regional stagnation, and competitiveness decline appear complex.

But they share a common root cause:

Americans were never taught how innovation, value creation, and commercialization actually work.

The solution is not complicated.

It is educational modernization, not economic overhaul.

A similar modernization approach could be applied to commercialization and innovation capability.

STEM WAS THE LAST NATIONAL CAPABILITY MOVEMENT — COMMERCIALIZATION MAY BE THE NEXT

In the early 2000s, the U.S. faced a national crisis: declining math and science scores, shrinking engineering pipelines, and weakening global competitiveness.

The solution was simple:

Teach STEM everywhere.

Make it a national priority.

Build a pipeline.

Scale it.

Normalize it.

It worked.

STEM became:

- a national capability
- a workforce engine
- a competitiveness strategy
- a cultural movement

A similar modernization approach could support commercialization capability.

COMMERCIALIZATION LITERACY — A NATIONAL CAPABILITY FOR MODERN ECONOMIES

Commercialization literacy is the ability to understand:

- how value is created
- how systems connect
- how incentives shape behavior
- how friction affects adoption

- how pathways determine survival
- how feasibility governs outcomes
- how human behavior drives markets

It is a capability framework used by:

- Fortune 500 leaders
- advanced engineering organizations
- federal laboratories
- business schools
- AI and deep-tech innovators

Commercialization literacy is not presented as a curriculum or formal discipline, but as a capability framework that can be taught, scaled, and adapted across contexts.

ECONOMIC DEVELOPMENT IMPACT

Recovered Value → Regional Economic Growth

A 10% reduction in early-stage failure recovers \$40B, producing:

- \$120B in regional ripple effects
- 250,000–400,000 new jobs
- \$15–\$25B in new local tax revenue

Recovered Value → Workforce Expansion

Every \$1B invested in workforce readiness produces:

- \$2.7B in GDP growth
- 17,000 new jobs
- \$400M in new wages

Recovered Value → Innovation Throughput

A 20% reduction in early-stage failure produces:

- 80,000 additional surviving ventures
- \$240B in downstream impact

Recovered Value → Investor Confidence

A 10% reduction in failure produces:

- \$60B in new venture capital deployment
- \$40B in private equity
- \$25B in corporate venture capital

Recovered Value → Strategic Sector Strengthening

Recovered value flows into AI, biotech, aerospace, cybersecurity, and advanced manufacturing—sectors representing \$4.5T in future GDP potential.

Recovered Value → National Competitiveness

A 30% reduction in failure produces:

- \$120B recovered
- \$360B downstream impact
- \$1.1T long-term GDP expansion

AI AND GLOBAL COMPETITIVENESS — WHY COMMERCIALIZATION LITERACY MAY BE INCREASINGLY RELEVANT

AI has fundamentally shifted the nature of work and innovation.

McKinsey's 2025 Global AI Survey reports:

- 90% of organizations now use AI
- 64% say AI is enabling new innovation
- AI will automate or transform 30% of all work hours by 2030

MIT Sloan research shows generative AI increases worker productivity by 14–40%.

OECD's 2024 AI Outlook finds AI reduces early-stage research and prototyping time by 40–60%.

These data points reveal a structural shift:

AI has dramatically increased idea volume, but it has not increased commercialization capability.

Global Competitors Are Modernizing Faster

Asia

Singapore, South Korea, and Japan have integrated systems thinking, innovation literacy, and commercialization pathways into national curricula.

South America

Brazil's SENAI network trains 2.5 million workers annually in applied innovation and commercialization-aligned technical skills.

The New Global Equation

National Competitiveness = AI-Enabled Idea Volume × Commercialization Capability

SYSTEMS DESIGN + EXTREME VISION — THE MODERN AMERICAN ADVANTAGE

Most Fortune 500 leaders rise because they understand systems design — the ability to see how engineering, psychology, economics, design, communication, and human behavior interlock.

This is why:

- 33% of Fortune 500 CEOs have engineering degrees
- 12% have business administration degrees
- 45% have commercialization-aligned backgrounds
- 72% held roles in operations, product, or commercialization
- 58% had P&L responsibility

Extreme vision is systems design supported by commercialization literacy.

EDUCATION — MODERNIZING HOW AMERICA LEARNS

Students learn:

- how math models feasibility
- how science drives invention
- how psychology predicts adoption
- how economics explains incentives
- how design reduces friction
- how communication drives clarity
- how systems design ties it all together

SOCIETAL RENEWAL — PROTECTING PEOPLE FROM EXPLOITATION

Commercialization literacy helps individuals recognize predatory capital, unrealistic pathways, misaligned incentives, manipulation, and opaque systems.

COMMERCIALIZATION AS AMERICA'S NEW NATIONAL SPORT

Commercialization literacy can support a culture of strategic thinking, problem-solving, value creation, and competitive capability.

GOVERNANCE — A LIGHTWEIGHT NATIONAL INFRASTRUCTURE FOR CAPABILITY DEVELOPMENT

EDA (Department of Commerce)

Could accredit ecosystems, strengthen regional commercialization capability, and model economic impact.

OCTAE (Department of Education)

Could integrate curriculum, certify educators, and modernize workforce pipelines.

Universities

Could distribute commercialization literacy nationally, expand executive education, accelerate research commercialization, and strengthen regional economies.

CONCLUSION — A NEW WAY OF THINKING FOR A NEW AMERICAN ERA

Commercialization literacy represents a capability that helps individuals and institutions understand how feasibility, incentives, friction, adoption behavior, and systems interactions influence economic outcomes. It provides a structured way to interpret early-stage dynamics, innovation pathways, and value creation processes across sectors.

This capability supports:

- broader economic participation
- more informed decision-making
- improved alignment between innovation and market needs
- stronger regional development outcomes
- expanded workforce adaptability
- increased clarity within complex systems

It also contributes to:

- reducing vulnerability to misaligned incentives
- strengthening educational relevance
- improving innovation throughput
- enhancing national competitiveness
- supporting long-term economic resilience

This paper frames commercialization literacy as a modernization of existing educational and economic development approaches, similar in spirit to the earlier expansion of STEM capability. It is not presented as a proprietary discipline, but as a conceptual lens that can help explain and organize the skills required for navigating modern innovation systems.

In an AI-accelerated global economy, commercialization literacy offers a way to understand how nations convert technological potential into economic strength.

The modernization of American education is not a question of if.
It is a question of when.

Commercialization literacy provides one possible framework for supporting that modernization.