International Council on Systems Engineering
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Generative AI and Artist Intellectual Property Rights: A Systems Approach

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Problem Statement

The Challenge: GenAI large language models extract and exploit intellectual property through training on human-generated media patterns, raising fundamental questions about ownership of artistic algorithms and cognitive frameworks.

The Gap: Traditional IP law protects outputs (novels, paintings, code) but not the cognitive algorithms that create them.

Our Approach: Systems analysis of sociotechnical factors to explore pathways for sustainable solutions that protect artistic integrity while enabling innovation.

Outline

I. Defining Cognitive Algorithms & the Law

II. Systems Analysis

III. A Socially Engaged Art (SEA) Project

IV. Conclusion

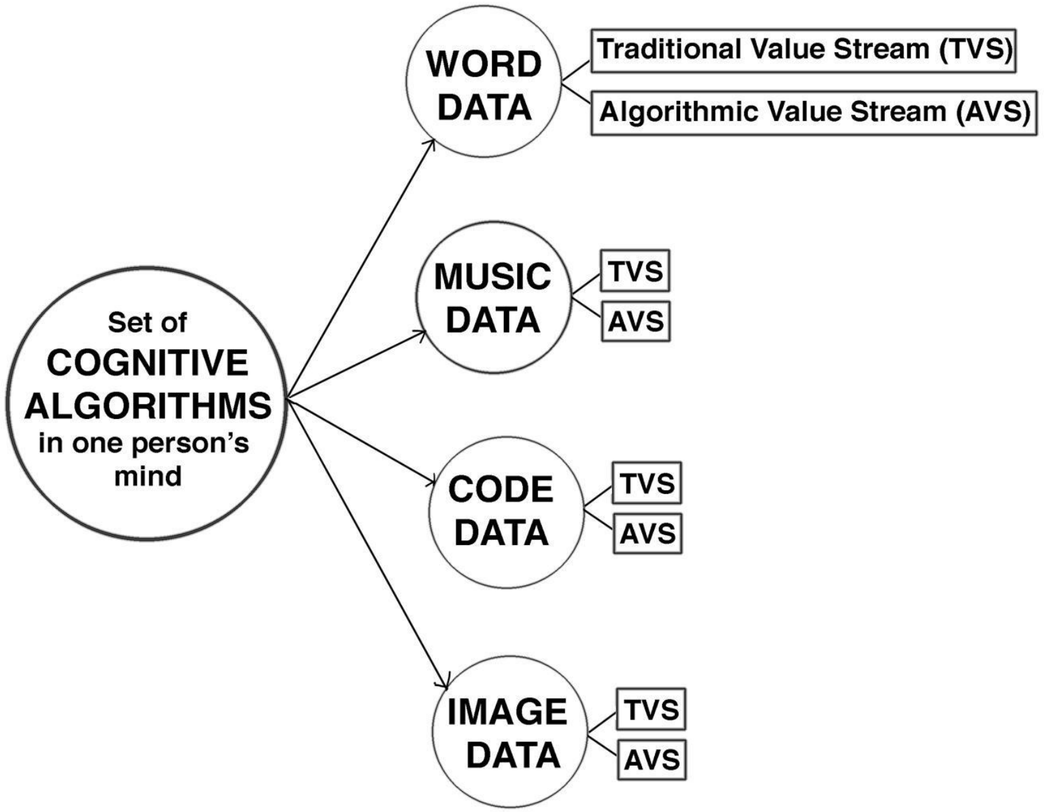
What Are Cognitive Algorithms?

Definition: "Procedural representations of a problem that coordinate memory, attention, and perception into sequences of useful computations and actions" (Thompson et al., 2022)

Key Characteristics:

- Result from cumulative cultural evolution and social learning
- Developed through years of education and practice
- Unique to each individual (like a creative fingerprint)
- Generate recognizable styles across outputs
- Represent significant investment by individuals and society

The Four Data Streams



Traditional Value Stream:

- Word Data → Writing careers and outputs
- Music Data → Musical careers and outputs
- Code Data → Programming careers and outputs
- Image Data → Visual arts careers and outputs

New Challenge: Algorithmic Value Stream extracts these same patterns without compensation

Costs and Rewards of Cognitive Algorithm Development

Investment Costs:

- K-12 education funded by parents and communities
- Additional investment in apprenticeships, college, graduate school
- Lifetime of practice and skill development
- Calculable as investment cost per individual per value stream

Expected Returns:

- Discrete works that can be monetized (novels, songs, paintings, code projects)
- Salary-based returns over working lifetime leading to retirement
- Expected ROI that can be measured

Legal Protections - Current Framework

Current Legal Protection:

- Fair use and copyright laws protect traditional value stream
- Government recognition of value to national economies
- Protection for individuals who produce work through traditional education and production processes

The Gap:

- Current legislation insufficient for algorithmic value stream
- Laws designed for human-to-human competition
- Don't address systematic extraction of cognitive algorithms

How Generative AI Disrupts Traditional Value Streams

Traditional Model: Investment → Cognitive Algorithm Development → Creative Output → Economic Returns

GenAI Disruption:

- Profit comes from licensing AI tools, not from creative outputs
- Value extracted by appropriating cognitive algorithms embedded in creative works
- AI developers mine cognitive patterns without paying for the resource

Key Insight: GenAI developers aren't interested in copying works - they want to replicate the cognitive algorithms that create them

The Mining Metaphor

Traditional Copyright Focus:

- Transformative use of existing works
- Fair use for new creative purposes
- Human artists building on prior work

GenAI Reality:

- Mining operation extracting cognitive algorithms
- No interest in traditional transformative value
- Appropriation of creative thought processes themselves
- Internet as a mine for cognitive resources

The Problem: Mining requires different rules than copyright and fair use

OpenAI's Fair Use Response - The Four Factors

OpenAI's Argument on Factor 1 (Purpose and Character):

- Training is "non-expressive" and "highly transformative"
- Different purpose than original human consumption
- Creates "useful generative AI system" rather than copying works

OpenAI's Argument on Factor 4 (Market Effect):

- Training "should not harm the market" for original works
- Consumed by machines, not humans
- No lost audience due to corpus use

Why OpenAI's Analysis Falls Short

The Real Issue:

- GenAI doesn't fully transform cognitive algorithms - it derives from them
- The "work of art" produced by OpenAI is the AI system itself
- Need to judge impact on potential market for cognitive algorithms, not individual works
- Threat is to entire traditional value stream, not individual copyrighted works

Systems Perspective:

- Appropriation of millions of cognitive algorithms through economies of scale
- Devastates potential market for human creativity
- Unlike any other copyright case because it targets the creative process itself

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Historical Context - Technology Adoption Patterns

Historical Parallels:

- **Printing Press (15th century):** Initially displaced manuscript artists, eventually expanded opportunities
- **Electronic Books:** Initially threatened traditional publishing, created new markets
- **Computer Graphics (1960s):** Initial resistance, eventual hybrid approaches

Common Pattern:

1. Initial displacement of existing practitioners
2. Market expansion
3. Emergence of new creative roles and opportunities

AI/ML Difference: Unprecedented learning capabilities may not follow historical patterns

Contemporary AI/ML Market Data

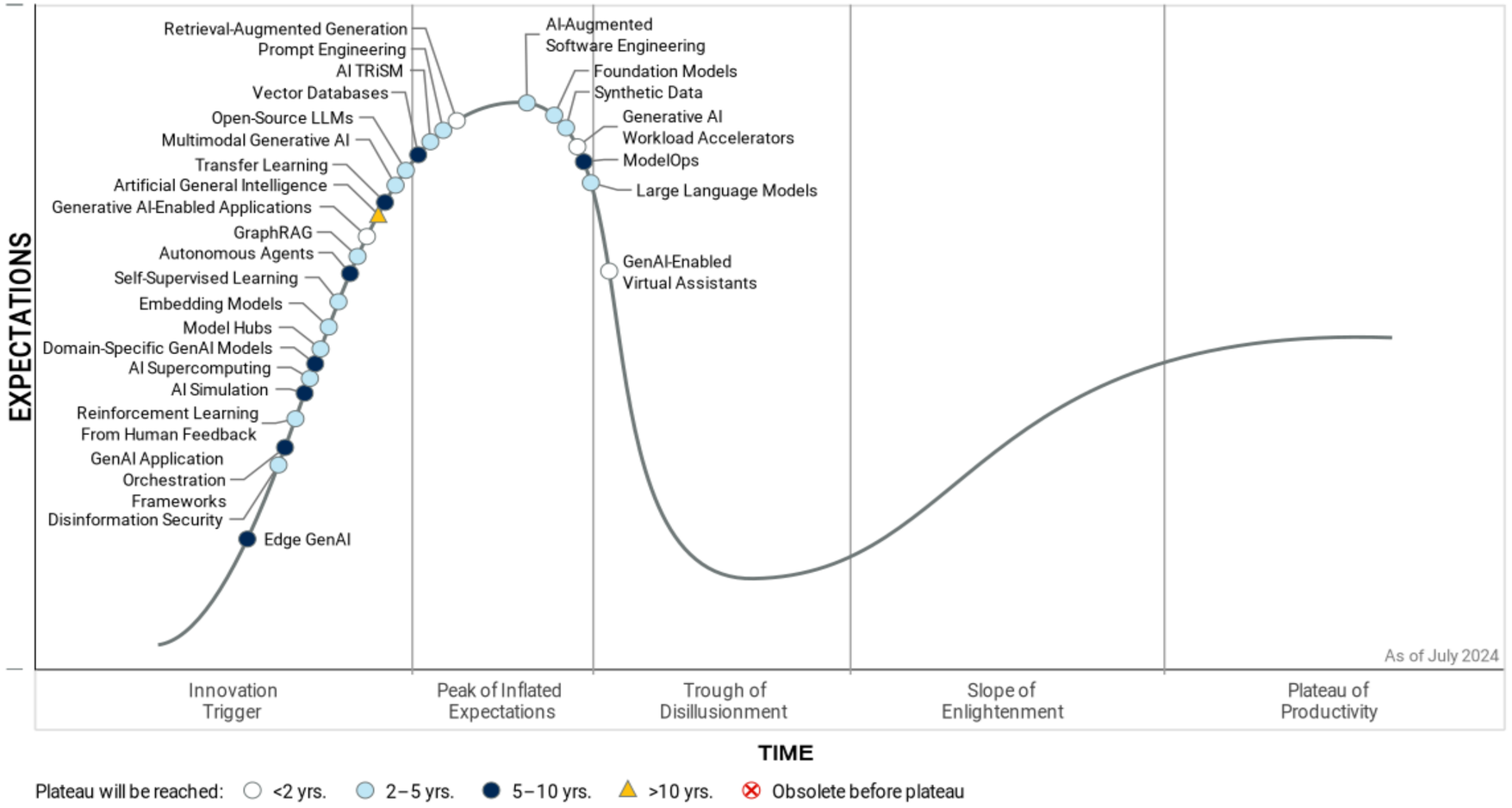
Market Growth:

- AI in Art Market projected to reach $40.4 billion by 2033
- Growth from $3.2 billion in 2023
- Robust CAGR of 28.9%

Historical Pattern Recognition:

- Rapid growth may reflect expectations rather than demonstrated value
- Likely in "Peak of Inflated Expectations" phase of Hype Cycle
- Compensation patterns show initial decline for traditional practitioners followed by new specialized roles

Technological Adoption: The “Hype Cycle”



(Source: https://www.gartner.com/en/newsroom/press-releases/2024-09-09-gartner-predicts-40-percent-of-generative-ai-solutions-will-be-multimodal-by-2027)

Systems Thinking Framework

Why Systems Thinking:

- AI/ML in creative industries presents complex socio-technical system
- Interrelationships between key variables and stakeholders
- Need to examine dynamics and implications of rapidly evolving landscape

Key State Variables:

1. Adoption and capability of AI/ML in art creation
2. Artist compensation
3. Profitability of art publishing houses

Systems Dynamics Advantage: Reveals unintended consequences and delayed effects overlooked in linear analysis

Introduction to Causal Loop Diagrams

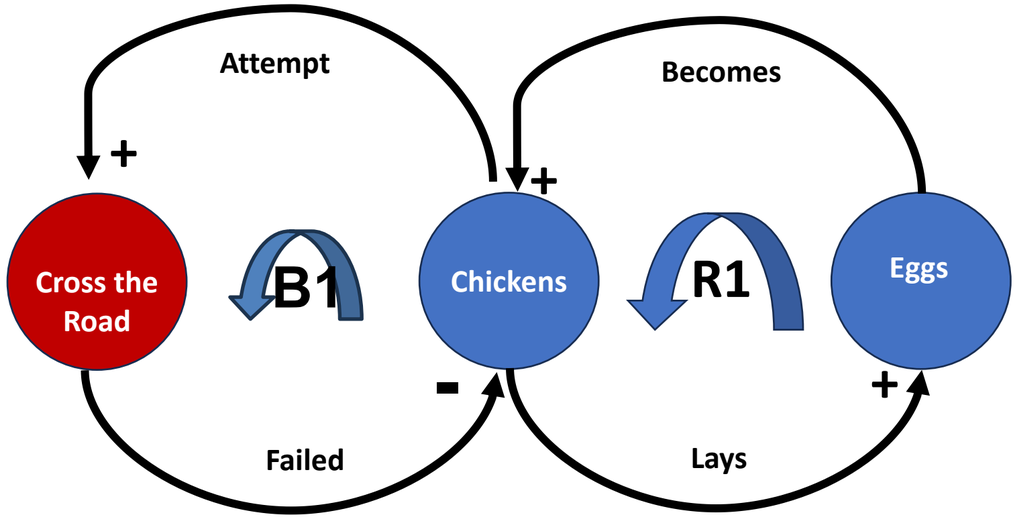
What CLDs Reveal:

- Visualize feedback relationships in socio-technical systems
- Identify key feedback loops and leverage points for intervention
- Show unintended consequences and delayed effects
- Provide means to visualize forces creating dynamic behavior

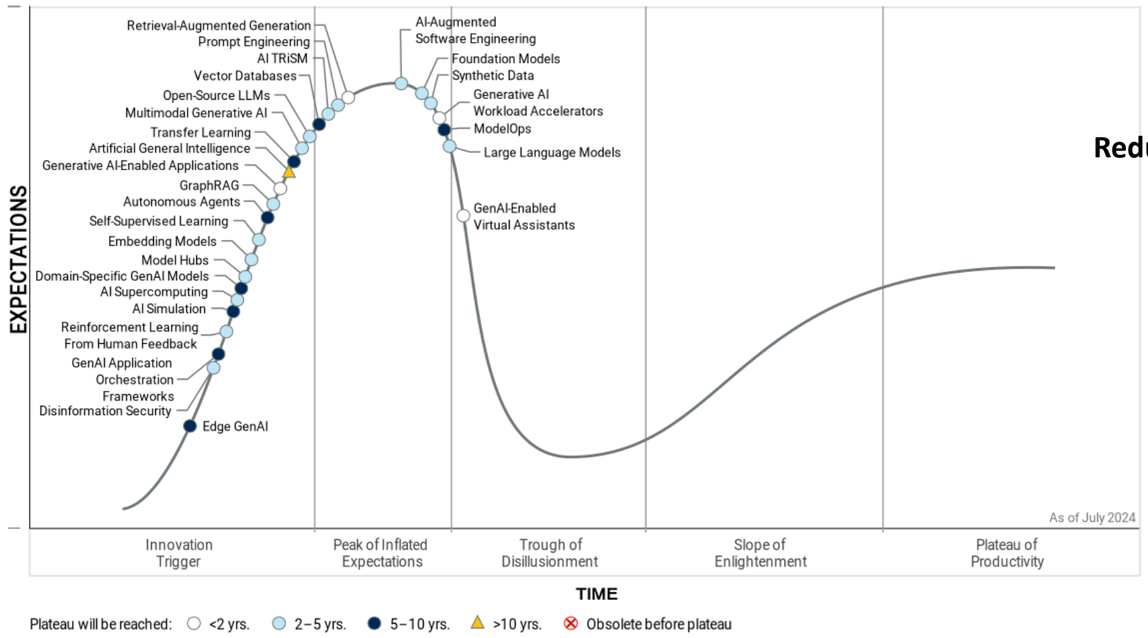
CLD Applications:

- Powerful tools for analyzing dynamics of socio-technical systems
- Help explain both Hype Cycle phenomenon and market penetration patterns
- Excel at revealing hidden system structure

Causal Loop Analysis: Example



Causal Loop Analysis: Hype Cycle



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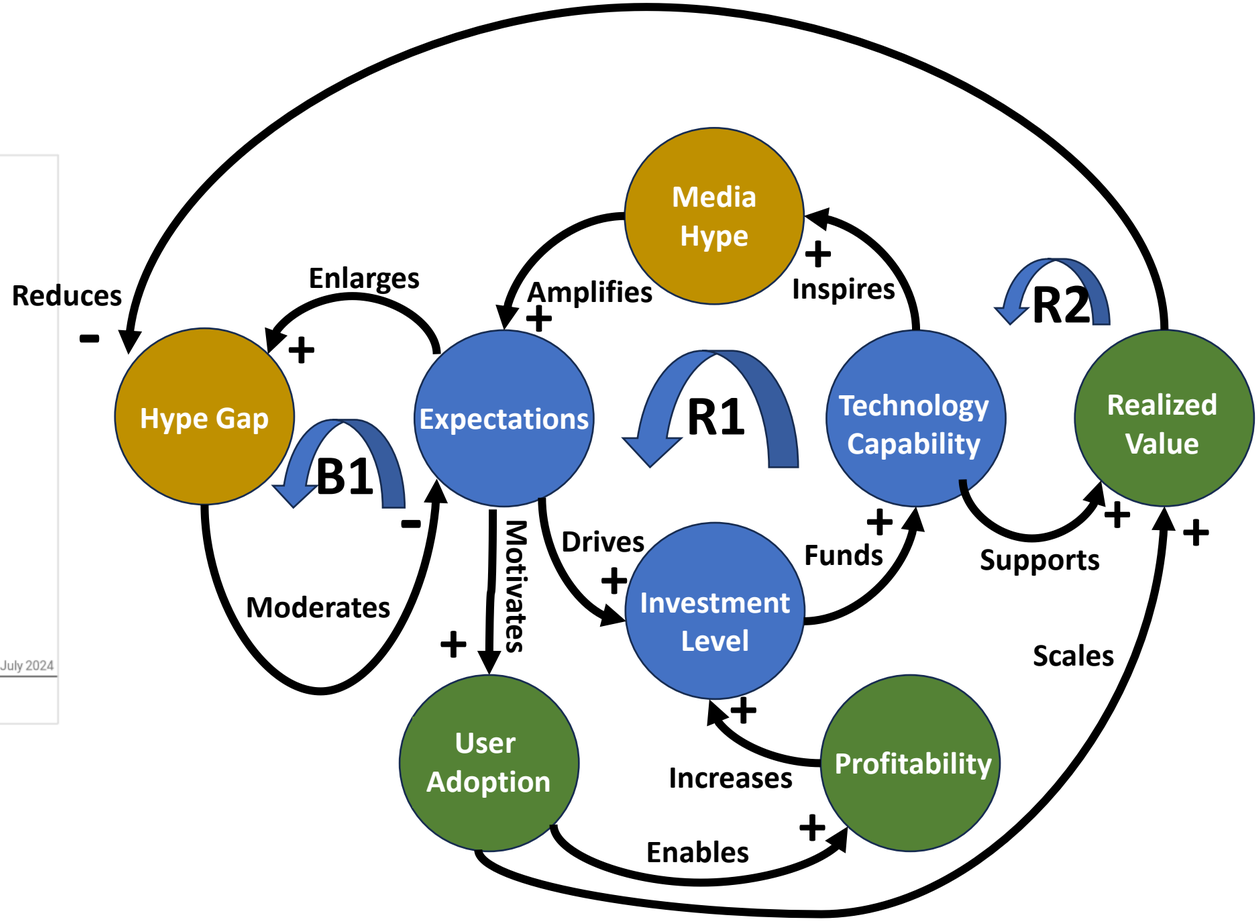


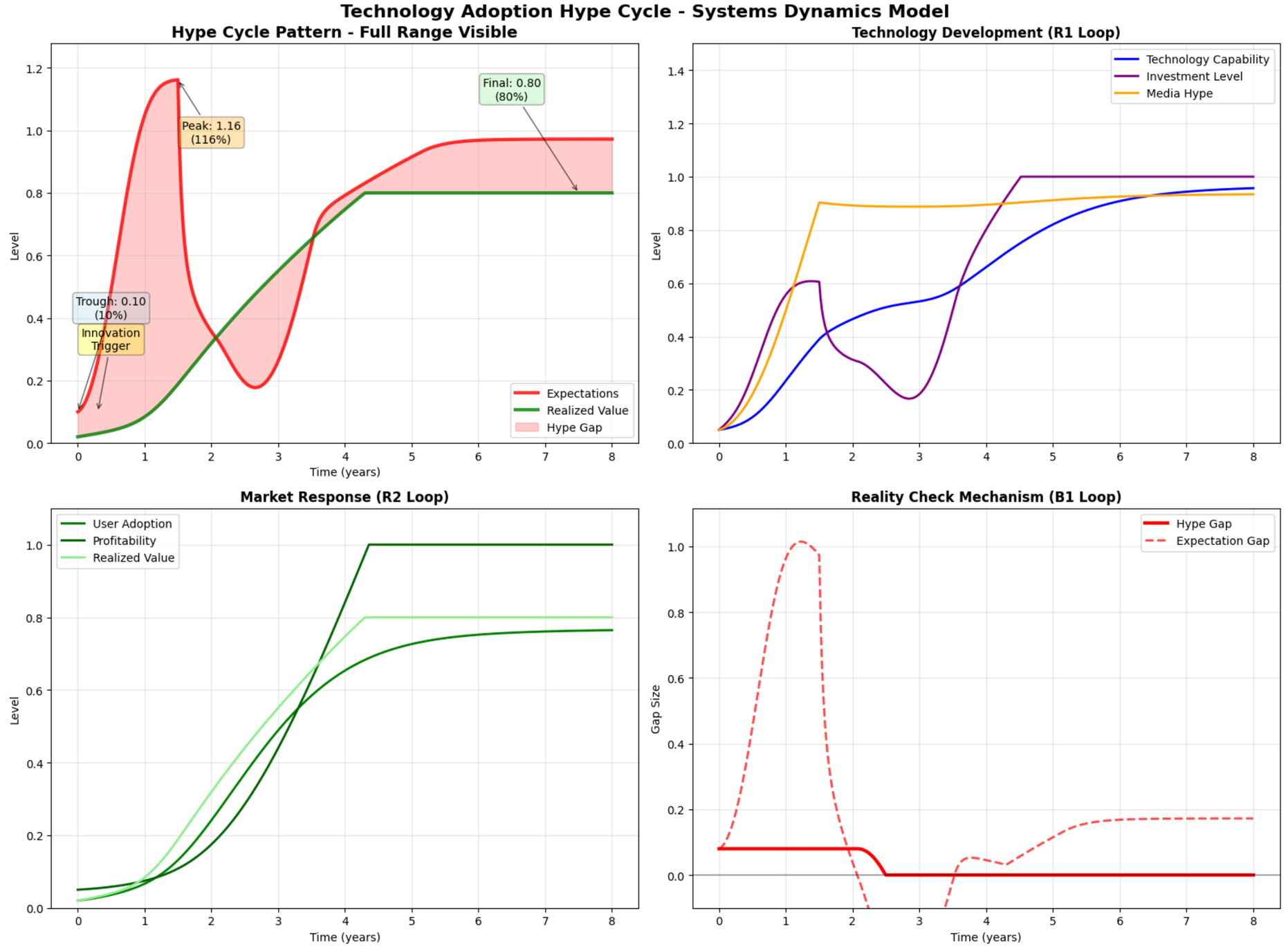
General Technology Adoption Model

Three Primary Feedback Mechanisms:

R1 - Expectation Loop: Media Attention → Expectations → Investment → Technology Capability → Media Attention

B1 - Reality Check: Technology Capability → Realized Value vs. Expectations → Disappointment Gap → Investment

R2 - Value Loop: Realized Value → Adoption → Network Effects → Actual Value → Realized Value


Technology Adoption Hype Cycle - Systems Dynamics Model
Hype Cycle Pattern - Full Range Visible
Peak: 1.16
(116%)
Final: 0.80
(80%)
Trough: 0.10
(10%)
Innovation
Trigger
Expectations
Realized Value
Hype Gap
Level
Time (years)
Technology Development (R1 Loop)
Technology Capability
Investment Level
Media Hype
Level
Market Response (R2 Loop)
User Adoption
Profitability
Realized Value
Level
Time (years)
Reality Check Mechanism (B1 Loop)
Hype Gap
Expectation Gap
Gap Size
Time (years)

Historical Evidence for the General Model

Desktop Publishing Revolution (1980s):

- Media coverage of Apple Macintosh and PageMaker drove investment
- Investment increased from $13 million (1983) to $1.2 billion (1988)
- Demonstrates R1 expectation loop in action

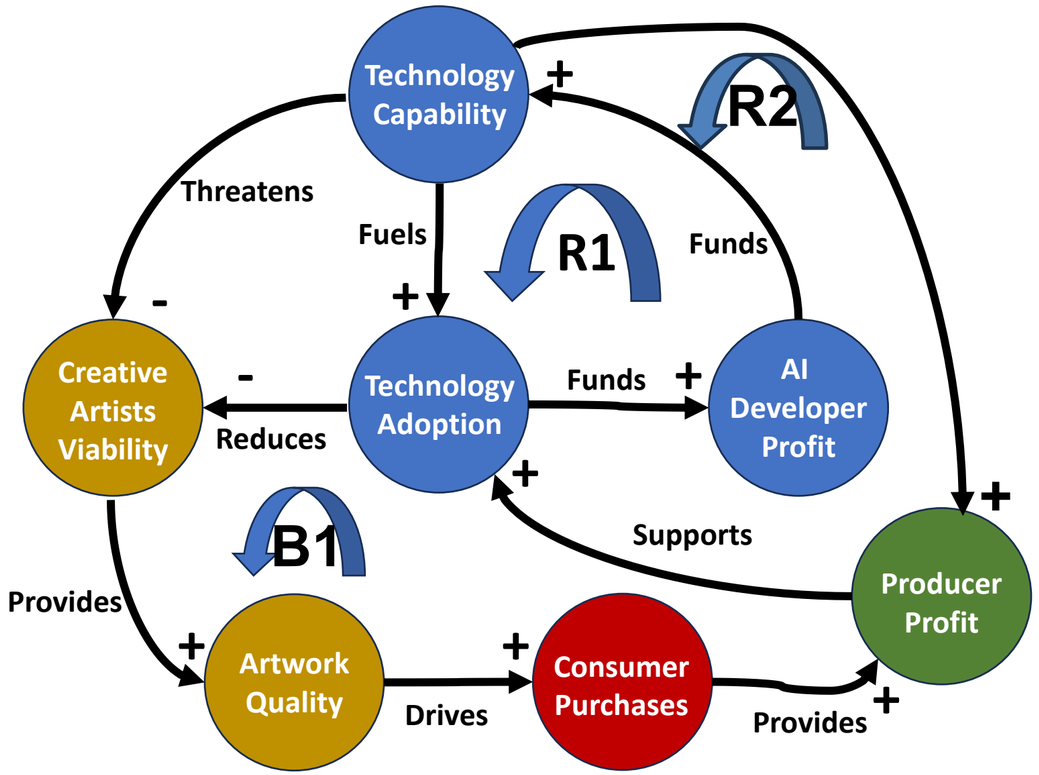
Digital Photography Transition:

- Professional adoption: 5% (1994) → 28% (1998) → 86% (2004)
- Classic S-curve driven by actual value (R2 loop)
- Sustainable adoption based on demonstrated utility

Virtual Reality Art Platforms (1990s):

- 72% reduction in venture capital (1996-1998) when technical limitations created disappointment gap
- Demonstrates B1 balancing loop effect

Creative Artists & AI: Current State



Current GenAI System Analysis

Problem Diagnosis:

- **R1:** Generic AI/ML Technology → AI Capability → Producer Adoption → Development Funding → Generic AI/ML Technology
- **R2:** Art Producers Using AI → Producer Profits → AI Investment → AI Development → Art Producers Using AI
- **B1:** Creative Artists Using AI → Artist Compensation (decreases) → Artistic Quality → Consumer Demand → Creative Artists Using AI

System Imbalance: Two powerful reinforcing loops vs. one weak balancing loop

Why the Current System is Unsustainable

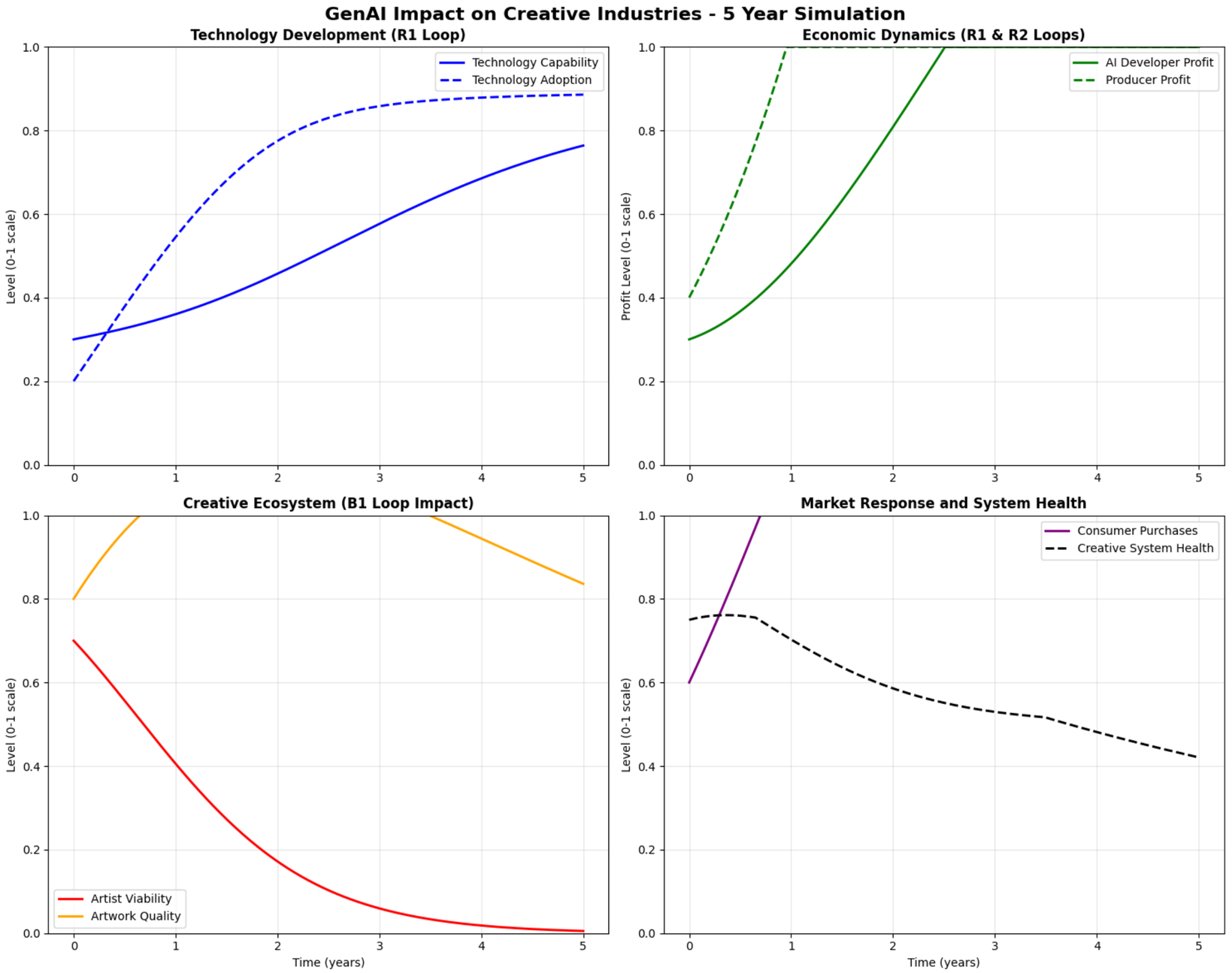
Reinforcing Loop Problems:

- R1 and R2 drive rapid AI adoption without considering externalities
- Focus on producer profits and technological capability
- Create competitive pressure for AI adoption

Balancing Loop Weakness:

- B1 quality degradation effects are delayed
- Reduced consumer demand occurs too slowly to provide timely correction
- Artists lose economic viability before market correction occurs

Net Result: Unemployed creative artists, unhappy consumers, producers with declining long-term prospects



KEY SIMULATION INSIGHTS:

Final Technology Capability: 0.764

Final Artist Viability: 0.005

Final Artwork Quality: 0.836

Time to 50% artist viability loss: 0.7 years

Leverage Points for System Intervention

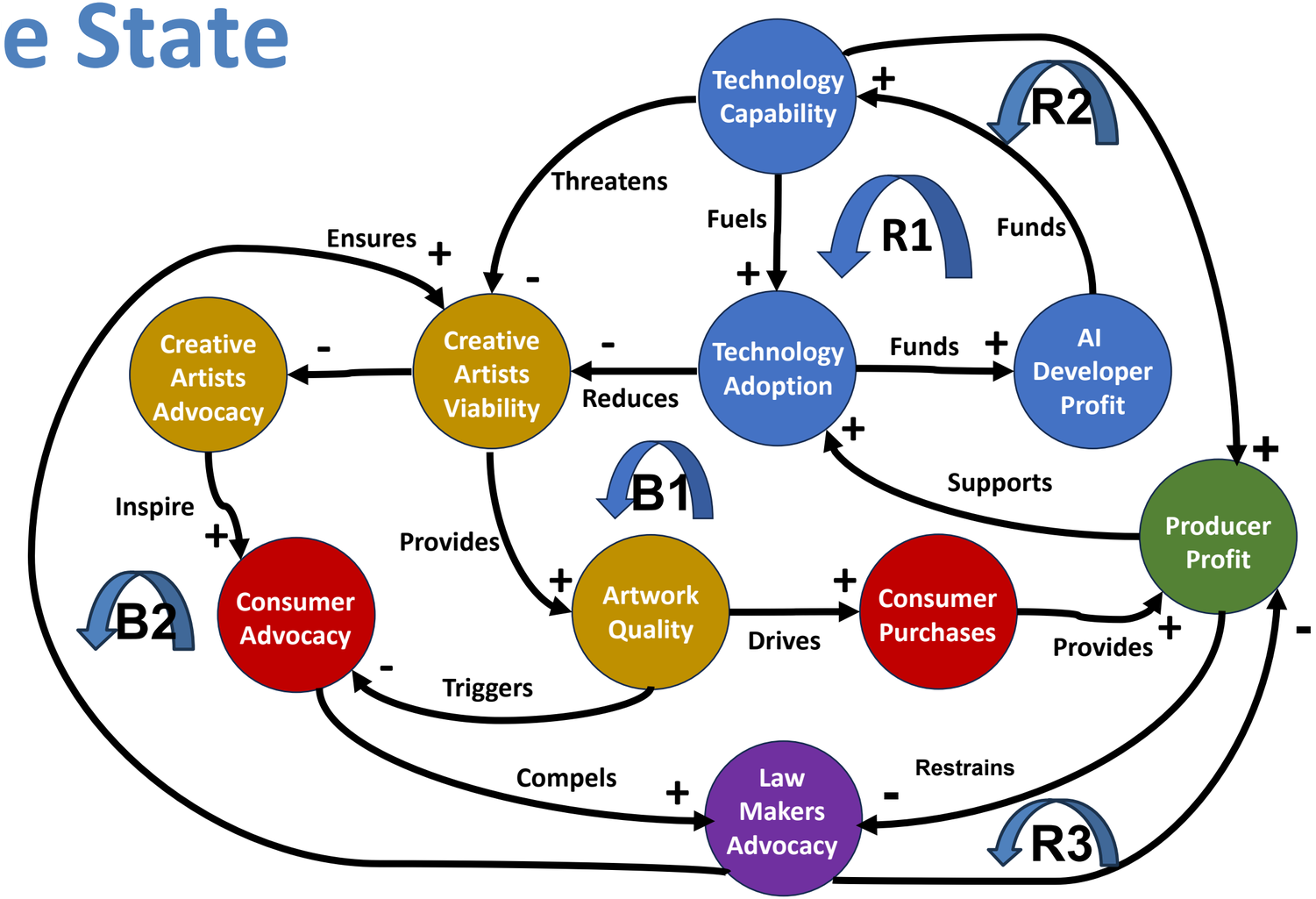
Meadows' Framework Applied:

- **Paradigms (High Leverage):** How industry conceptualizes creator-commercial relationships
- **Goals (Medium-High):** Revenue sharing and artistic control objectives
- **Rules (Medium):** Contract structures and decision-making processes
- **Information Flows (Medium-Low):** Transparency in sales reporting and royalty calculations

Key Insight: Paradigm shifts create more powerful change than parameter adjustments

Research Evidence: Clear goal-setting and transparent reporting significantly improve system stability

Creative Artists & AI: Future State



Proposed Solution - Sustainable System Design

Strategic Additions (shown in purple):

- **B2:** Creative Artist Advocacy → Consumer Support → Voter Pressure → Fair IP Laws → Artist Compensation
- **B3:** Fair IP Laws → New Business Models → Artist-Producer Partnerships → Sustainable Economy → Long-term Value
- **R3:** Producer Profits → Producer Advocacy → Influence on Lawmakers (competing with B2)

Design Goal: Balance technological innovation with creator sustainability

Implementation Through Legal Intervention

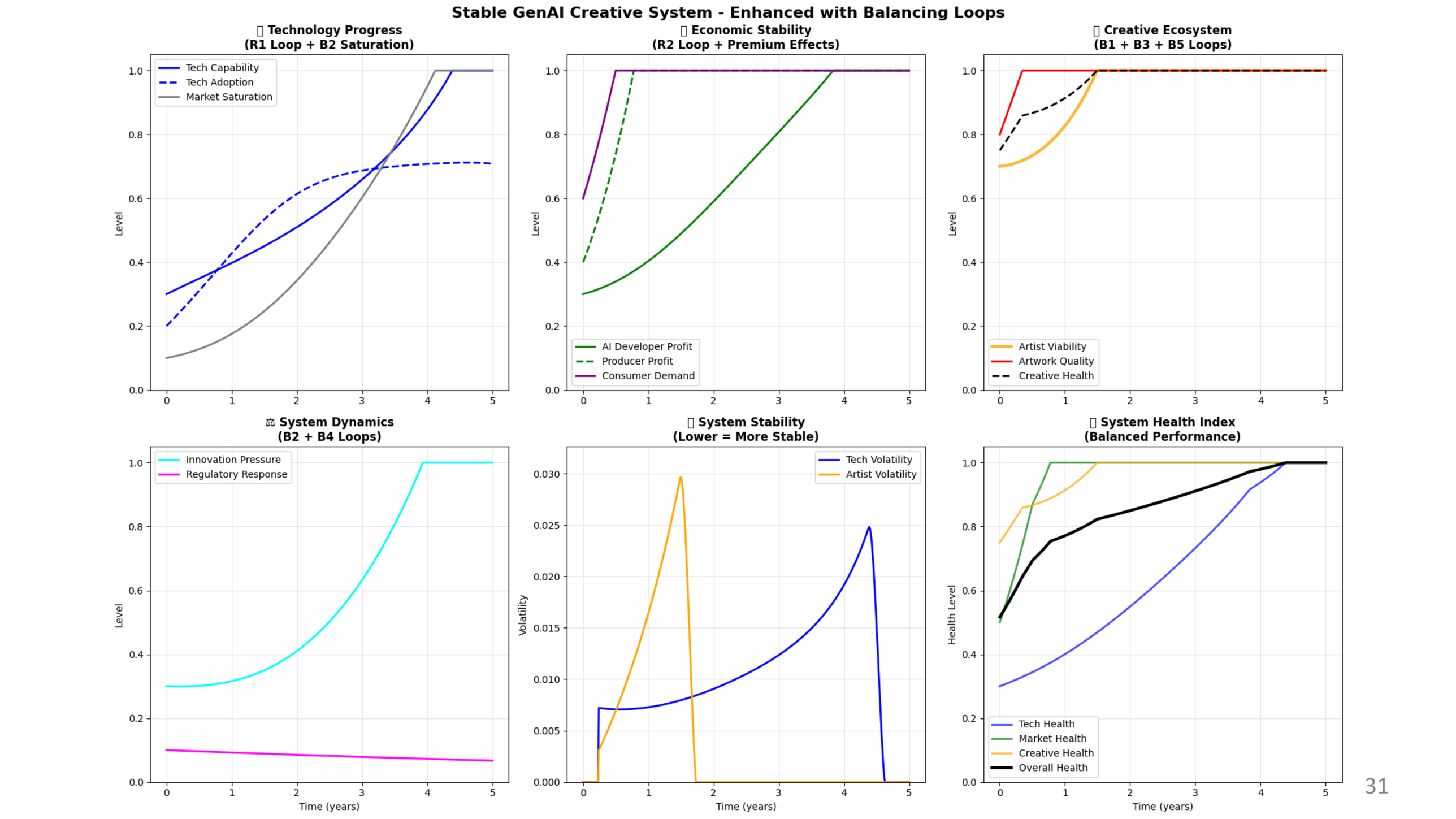
B2 - Democratic Process:

- Artist advocacy inspires consumer support
- Consumers as voters influence lawmakers
- Creates fair IP protection laws
- Increases artist compensation, reducing need for advocacy

B3 - Economic Realignment:

- Fair laws enable new business models
- Artist-producer partnerships become viable
- Creates mutually beneficial arrangements
- Generates sustainable long-term value

Challenge: R3 loop shows producers can use profits to influence lawmakers, requiring sustained democratic engagement


Stable GenAI Creative System - Enhanced with Balancing Loops
 Technology Progress
(R1 Loop + B2 Saturation)
Tech Capability
Tech Adoption
Market Saturation
Level
 Economic Stability
(R2 Loop + Premium Effects)
AI Developer Profit
Producer Profit
Consumer Demand
Level
 Creative Ecosystem
(B1 + B3 + B5 Loops)
Artist Viability
Artwork Quality
Creative Health
Level
⚖ System Dynamics
(B2 + B4 Loops)
Innovation Pressure
Regulatory Response
Level
Time (years)
 System Stability
(Lower = More Stable)
Tech Volatility
Artist Volatility
Volatility
Time (years)
 System Health Index
(Balanced Performance)
Tech Health
Market Health
Creative Health
Overall Health
Health Level
Time (years)

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Path Forward - Four Primary Objectives

1. Empowering Artists:

- Equip artists with knowledge of IP value chain
- Provide tools to protect cognitive algorithms

2. Influencing AI Development:

- Encourage ethical, transparent practices
- Promote respect for artistic IP

3. Educational Reform:

- Inform future AI developers and policymakers
- Integrate curriculum addressing AI ethics and artistic integrity

4. Promoting Ethical Sustainability:

- Advocate for systems-level solutions
- Balance technological advancement with creative rights preservation

Systems Integration Framework

Diverse Perspectives Integration:

- Artistic: Creative process and intellectual property rights
- Technological: AI development capabilities and limitations
- Consumer: Quality expectations and value preferences
- Legal: Regulatory frameworks and enforcement mechanisms

Unified Framework Benefits:

- Respects intellectual property rights of creators
- Supports responsible, sustainable AI innovation
- Balances competing stakeholder interests
- Creates pathways for collaborative solutions

Methodology - Socially Engaged Art Practices

Platform Development:

- Dedicated online platform (genaiandcomics.com) serves as information resource
- Repository for artists to showcase creative processes
- Reinforces claims to intellectual ownership

Three Engagement Methods:

1. Online questionnaire helping artists document cognitive algorithm development
2. Face-to-face interaction at Comic-Con Convention (216 presenters contacted)
3. Encourage documentation of creative processes in graphic novel form

Goal: Document and assert ownership of cognitive algorithms through creative process visualization

www.GenAIandComics.com

Have I Been Trained?

- Search for your work in popular AI training datasets: https://haveibeentrained.com

- AI organizations, respect opt-outs in your models: https://haveibeentrained.com/terms-of-service

The Glaze Project

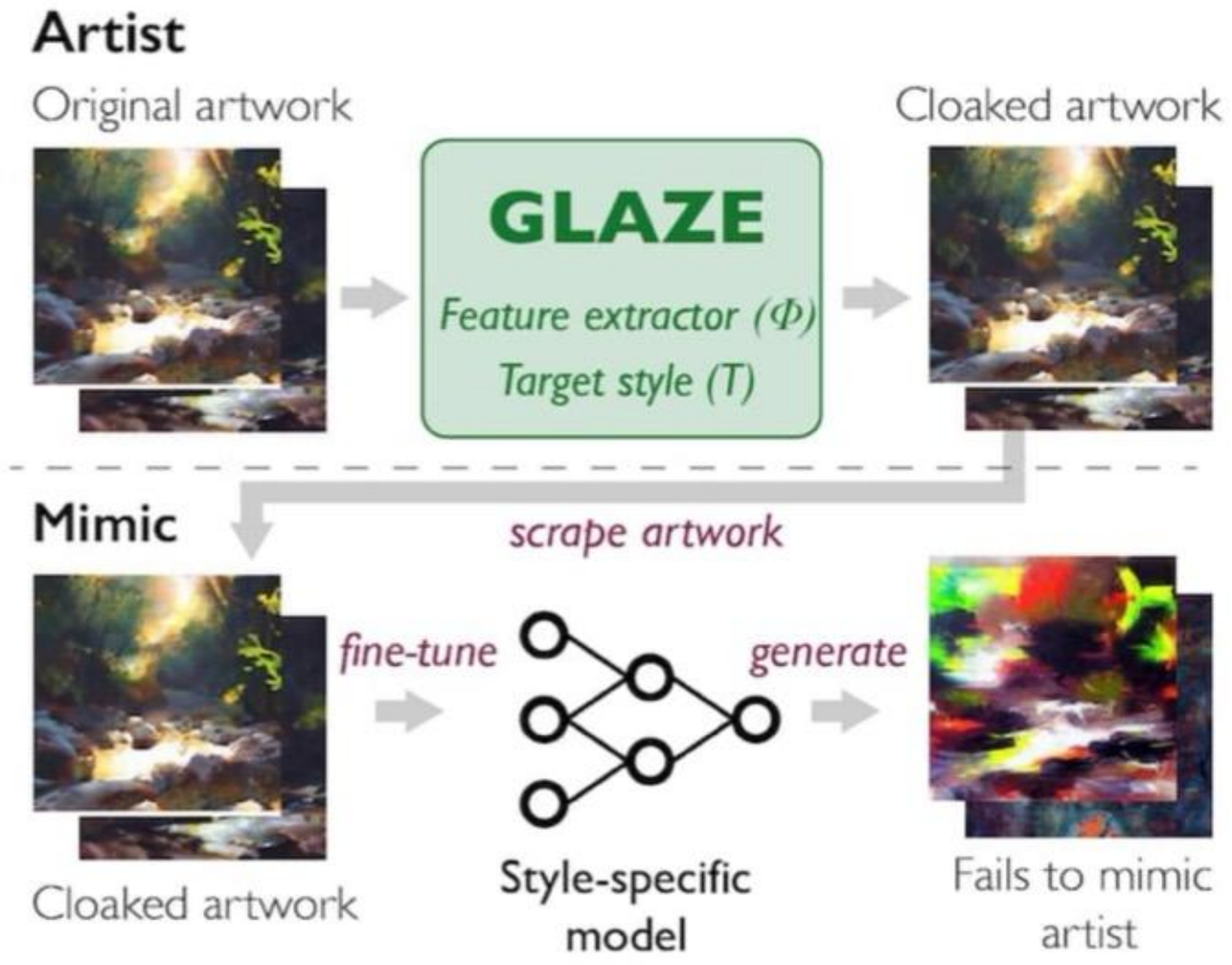

Diagram courtesy of Glaze.

Expected Outcomes

Artist Empowerment:

- Tools and strategies to protect creative IP in digital age
- Enable artists to assert ownership over cognitive algorithms

AI Developer Accountability:

- Promote awareness and ethical considerations within AI community
- Encourage adoption of protective measures for artistic IP

Legal Reform Advocacy:

- Updates to copyright laws recognizing cognitive algorithms as protected IP
- Explicit legal framework for new form of intellectual property

Collaborative Systems Integration:

- Foster constructive dialogue between artists, developers, and educators
- Achieve balanced, artist-centered AI ecosystem

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Conclusion - Systems Approach Value

Problem Framing:

- Recognizing cognitive algorithms as intellectual property is critical
- Traditional IP law insufficient for algorithmic value extraction
- Systems perspective reveals intervention pathways invisible to linear analysis

Solution Framework:

- Artists can assert ownership through documentation and advocacy
- Developers can adopt fair practices through new business models
- Legal frameworks can evolve to protect artistic integrity

Systems Insight: Sustainable AI innovation requires protecting the creative ecosystem that enables continued development

Future Research Directions

Technology Evolution:

- How will advancing AI capabilities affect cognitive algorithm extraction?
- What new forms of creative AI partnership might emerge?
- How can attribution and compensation systems scale?

Policy Development:

- International coordination across different legal frameworks
- Evolution of IP law to address new forms of intellectual property
- Balancing innovation incentives with creator protection

Systems Applications:

- Extension to other creative domains beyond visual arts
- Application to other technology adoption challenges
- Refinement of intervention strategies based on outcomes

Assumptions

Source: https://itrevolution.com/articles/cynefin-four-frameworks-of-portfolio-management/

The New York Times

Trump Plans to Give A.I. Developers a Free Hand

With executive orders and an "A.I. Action Plan" to promote American dominance of the technology, President Trump declared that the United States needed to win the A.I. race.

President Trump detailed a new "A.I. Action Plan," which contains policy guidelines to encourage the growth of the artificial intelligence industry in the United States. Kenny Holston/The New York Times

By David McCabe and Cecilia Kang
Reporting from Washington

July 23, 2025

President Trump said on Wednesday that he planned to speed the advance of artificial intelligence in the United States, opening the door for companies to develop the technology unfettered from oversight and safeguards, but added that A.I. needed to be free of "partisan bias."

In a sweeping effort to put his stamp on the policies governing the fast-growing technology, Mr. Trump signed three executive orders and outlined an "A.I. Action Plan," with measures to "remove red tape and onerous regulation" as well as to make it easier for companies to build infrastructure to power A.I.

One executive order barred the federal government from buying A.I. tools it considered ideologically biased. Another order would speed up the permitting process for major A.I. infrastructure projects, and a third focused on promoting the export of American A.I. products around the world.

"America is the country that started the A.I. race," Mr. Trump said in a Wednesday evening speech in front of administration officials and tech executives, including Jensen Huang, the chief executive of the chipmaker Nvidia. "And as president of the United States, I'm here today to declare that America is going to win it."

Let’s connect

- To Learn More About This Project go to:
- www.genaiandcomics.com

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