

The Adaptive Physics of Organizations

A conceptual foundation for the Adaptive Fitness System (AFS)

By Mario Aiello

Friction is the turning point where pressure becomes reality.

1. The Problem with Most Change Thinking

Most organizational change approaches assume a simple progression: awareness → decision → action → improvement.

In practice, this rarely holds. Organizations often understand their problems clearly, agree on the direction, and commit significant resources — and still fail to adapt.

This is not a failure of intent or intelligence. It is a failure to understand the underlying forces that govern adaptive behavior.

AFS begins from a different premise: organizations do not adapt through plans alone. They adapt through the interaction of systemic forces.

2. The Adaptive Physics Proposition

Adaptiveness can be read through the interaction of five forces: Energy, Gradients, Friction, Flow, and Fitness.

Call them a lens, not a law. They are not derived from a deeper theory, and they are not measurable the way physical forces are. What they do is give diagnosis a vocabulary that practices and structures don't — a place to ask where energy is trapped, which gradient is being ignored, and what kind of friction you're actually looking at, before reaching for an intervention.

Fitness is not a starting point. It is the outcome of how the other four interact.

3. The Five Forces of Adaptiveness

3.1 Energy — Capacity to Move

Energy is the system's mobilizable capacity for coordinated action. It includes decision authority, leadership attention, resources and time, trust and legitimacy, political cover.

Many transformations fail not because the direction is wrong, but because energy is fragmented, constrained, or unusable.

Key question: where is adaptive energy available, blocked, or trapped?

3.2 Gradients — Pressure for Change

Adaptation begins with meaningful differences that create tension. Typical gradients include gaps between strategy and operations, demand and capability, environment and response speed, local knowledge and centralized control.

Gradients are not directly measurable. They are inferred through signals such as conflicting priorities, repeated reinterpretation, escalation patterns, persistent misalignment. No gradient, no movement.

Key question: where are the tensions the system can no longer absorb?

3.3 Friction — Where Reality Pushes Back

When energy moves through gradients, it encounters constraints. This produces friction. Friction is not inherently negative — it appears in three forms: destructive friction (bottlenecks, bureaucracy, conflicting incentives), protective friction (risk controls, governance, quality assurance), and generative friction (constructive tension, challenge, disciplined debate).

Mature systems do not eliminate friction. They shape it deliberately. Friction is where reality pushes back on design.

Key question: where does movement encounter resistance, and what kind of friction is it?

3.4 Flow — Movement Through the System

Flow is the system's ability to propagate movement — of information, decisions, work, learning. Impaired flow converts energy into noise rather than change. Symptoms include decision latency, stalled initiatives, fragmented learning, workarounds and shadow systems.

Key question: where does movement stall, fragment, or fail to propagate?

3.5 Fitness — Systemic Viability

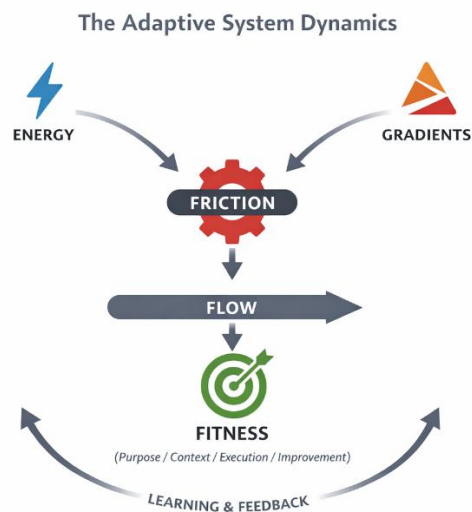
Fitness describes whether the system remains viable and adaptive over time. Within AFS, fitness is assessed through four lenses: Fit for Purpose, Fit for Context, Fit for Execution, Fit for Improvement.

Fitness is not static. It emerges from how energy, gradients, friction, and flow interact. Adaptiveness is the ability to convert friction into fitness.

4. The Adaptive Logic

Adaptation follows a consistent systemic pattern: gradients create pressure, energy mobilizes response, friction reveals constraints, flow determines propagation, fitness evaluates the outcome.

When these forces align, organizations evolve. When they misalign, systems produce inertia, noise without change, fragmentation, or uncontrolled movement without coherence.



5. Connecting to AFS

The Adaptive Fitness System remains fitness-cantered. The Adaptive Physics layer does not replace AFS. It grounds it — it explains why fitness gaps emerge, why awareness does not translate into action, why some interventions fail despite good intent.

Gradients explain why change pressure exists. Energy explains whether change is possible. Friction reveals where misfit becomes visible. Flow determines whether change can propagate. Fitness evaluates whether the system is viable.

6. Implications for Practice

- Do not start with solutions. Start by identifying gradients and friction patterns.
- Do not assume resistance is the problem. Distinguish between destructive, protective, and generative friction.
- Do not equate activity with progress. Assess whether flow is actually propagating change.
- Do not treat fitness as a static target. Continuously evaluate system viability across all four dimensions.

7. Signals Before Friction

Before friction becomes visible, systems emit early signals: anomalies, weak signals, narrative fragments, irony and humour, behavioral inconsistencies. These indicate emerging gradients.

As misfit intensifies, these signals consolidate into friction, which then becomes diagnosable through fitness gaps.

8. A Unifying Perspective

Most change models focus on practices, structures, or behaviors. The Adaptive Physics perspective focuses on forces and interactions. This allows AFS to move beyond prescriptions toward systemic understanding.

Organizations do not adapt by removing all tension. They adapt by converting tension into movement, and movement into fitness.

Limitations

The risk of this piece is obvious: physics language can sound authoritative in a way it hasn't earned. Energy, Gradients, Friction, Flow, and Fitness are not derived from equations, and nothing here is a formal model. They are a set of diagnostic questions, dressed in borrowed vocabulary because that vocabulary is good at describing tension and movement — nothing more.

The five-force list is also not settled. It is the current cut, not a discovered structure. If a practitioner finds a sixth force worth tracking, or finds one of these five doesn't earn its place in a given engagement, the list should move.

Closing Thought

None of this replaces diagnosis. It is a way of listening before you diagnose — noticing where energy is trapped, which gradient is being ignored, what kind of friction you're actually dealing with, before reaching for a fix.

Adaptiveness is the intelligent shaping of friction, not its absence.

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