From Requirements Change to Cost Intelligence

Reconnecting Scope Evolution to Baseline Durability

Modern programs generate vast amounts of digital data, yet one of the most consequential relationships in program management remains poorly understood: how evolving requirements translate into downstream cost erosion before execution begins.

“The digital thread becomes a tool for managing change, not just recording it.”

Requirements are versioned, estimates are adjusted, and baselines are re-approved, but these activities typically occur in parallel rather than as an integrated analytical process. As a result, cost impacts are often understood only after execution variance has materialized.

This work reframes requirement evolution itself as a measurable, learnable signal. Rather than treating changes as isolated approvals or narrative justifications, requirement-to-requirement differences are captured as structured change events characterized by semantic magnitude, timing, change class, and propagation across the work breakdown structure. These attributes describe not just that a change occurred, but how it occurred.

“Baseline durability is driven less by the size of an estimate change than by the structure and timing of scope evolution that surrounds it.”

Using explainable predictive models, the framework learns cost-impact patterns from historical change behavior while preserving traceability and governance. Results show that semantic magnitude is a dominant driver of realized cost growth—often rivaling or exceeding the influence of approved estimate adjustments. Lifecycle timing and propagation breadth further explain why similar estimate deltas can lead to materially different execution outcomes.

“Explainable AI is used not to automate decisions, but to make cost risk traceable, auditable, and reviewable before execution begins.”

For estimators and change boards, this enables earlier identification of high-risk changes, stronger baseline negotiation, and more informed estimate selection. Decisions shift from retrospective variance explanation toward proactive cost intelligence, while preserving human judgment and auditability. The framework operates without exposing proprietary cost data, enabling organizations to learn from patterns while maintaining confidentiality.

PROJSTREAM
THINK FORWARD