

Member Communication Experience

The Owner Intelligence Framework: Metrics That Surface Problems Before They Become Claims

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Everyone in construction has heard of the Big Dig. What began as a \$2.8 billion highway project in Boston ultimately cost nearly \$15 billion and finished years behind schedule. Investigations later showed that many of the problems were visible long before they became crises. The failure was not one of engineering. It was a failure of project intelligence.

That pattern is not unique to megaprojects. It appears on a \$15 million school renovation, a \$40 million office building, and a \$200 million mixed-use development. Scale changes. The pattern does not.

Owners rarely lose projects because information does not exist. They lose projects because the signals that matter are buried inside billing reports, schedule updates, document logs, and inspection records that were never designed to provide an integrated view of project health.

The most consequential lesson from the Big Dig was structural. The owner depended on filtered reporting rather than direct visibility into project data. By the time cost overruns and schedule erosion became undeniable, corrective options had narrowed and costs had multiplied.

The remedy is not more reports. It is a common operating picture built on shared project data and a set of metrics designed to expose emerging problems while they are still manageable.

This Owner Intelligence Framework organizes those metrics



into four categories:

- » **Financial Intelligence:** Is value being added to the building staying aligned with cost and cash flow?
- » **Schedule and Jobsite Progress:** Where is schedule resilience being lost before milestones slip?
- » **Project Administration and Controls:** Are workflows moving fast enough to keep schedule and financial performance healthy?
- » **Quality:** Which risks survive project closeout and become the owner's problem?

Together, these metrics give owners and owner's representatives a practical framework for seeing problems while they are still decisions, not claims.

FINANCIAL INTELLIGENCE

Financial metrics answer a simple question: is the value being added to the building staying aligned with cost and cash flow?

Traditional financial reporting focuses on how much has been spent. Owners need more than that. They need to know whether billing reflects work performed, whether change activity is converging toward certainty or continuing to expand, and whether the financial protections that exist early in a project will still exist near completion.

These metrics depend on two prerequisites. The first is a cost-loaded schedule that establishes planned value over time. The second is shared access to project data. Owners reconciling spreadsheets against contractor reports are not performing financial oversight; they are reconstructing history. Effective oversight requires both parties to work from the same underlying information.

The metrics in this section focus on billing alignment, change order behavior, and retainage exposure. Together, they answer whether the project's financial condition is stable, whether uncertainty is increasing or decreasing, and whether the owner retains adequate leverage as the project approaches completion.

BILLING ALIGNMENT INDEX

The Billing Alignment Index answers three questions simultaneously: how much should have been billed by now, how much work has actually been completed, and how much has actually been billed. When billed value exceeds earned value, the owner is paying ahead of production. When billed value exceeds planned value, cash is being drawn faster than the schedule justifies. When earned value runs ahead of billing, the project may be accumulating administrative, coordination, or cash flow pressure that often surfaces later as larger pay applications. Temporary gaps are normal. Persistent divergence over multiple billing cycles is not.

Healthy projects establish a stable relationship between planned, earned, and billed value early. The trend matters more than the number.

CHANGE ORDER VELOCITY AND SOURCE

Total change order value tells the owner how much the

project has changed. Change order velocity reveals whether uncertainty is converging or still expanding. Healthy projects experience declining change activity as construction progresses. Persistent or increasing change order velocity after early construction often signals unresolved design issues, coordination conflicts, or bid assumptions that are still being discovered in the jobsite.

Source matters as much as frequency. Owner-driven changes reflect business decisions, while design omissions, scope clarifications, and rework reveal weaknesses that should have been resolved before construction began. As the project evolves, working baselines should be updated while preserving visibility into variance from the original commitment.

Total change orders measure how much changed. Change order velocity reveals whether the project is becoming more certain or less.

RETAINAGE EXPOSURE INDEX

Retainage is the owner's primary financial leverage, but its effectiveness changes as the project approaches completion. The Retainage Exposure Index compares retainage held against the remaining cost to complete. When retainage exceeds the remaining exposure, the owner retains leverage. When the relationship reverses, the owner may lose leverage before the work is finished. This metric becomes more meaningful when combined with trade partner payment lag and lien release timing. Delays in passing payments downstream or obtaining lien releases may indicate disputes or financial stress that ultimately increase the owner's exposure.

Retainage protects the owner only if it remains larger than the problem that still needs to be finished.

SCHEDULE AND JOBSITE PROGRESS

A percentage complete number and a monthly Gantt chart document what has happened. Owners need metrics that indicate where schedule resilience is being lost before milestones slip. Schedule metrics work best at the milestone level, update weekly, and distinguish office activities from jobsite execution. Together, they show where delays originate, how quickly the schedule buffer is being consumed, and which trades are drifting before the impact becomes visible in project-level reporting.

MILESTONE PERFORMANCE: OFFICE VS JOBSITE

Office activities and jobsite execution should be measured separately at the milestone level rather than through a single percent complete. Permits, design approvals, procurement, and submittal reviews determine when jobsite work can begin and often compress downstream execution when they slip. Jobsite activities carry immediate cost consequences through extended general conditions, resequencing, and productivity losses. Measuring both streams separately reveals not only where delays originate, but what they are costing.

Office delays become jobsite delays. Owners should measure both separately.

FLOAT CONSUMPTION

Float is the schedule's shock absorber. The amount of float remaining matters, but the rate at which it is being consumed matters even more. Rapid consumption of float signals loss of schedule resilience before milestones are missed. Activities with zero float become critical, and continued consumption narrows the window for corrective action. The conversation should focus on which trades are consuming float, not just how much remains.

Milestones fail long after the schedule buffer disappears.

PROCUREMENT AND DOCUMENT SCHEDULE EXPOSURE

Submittals, RFIs, and procurement approvals should be measured in schedule days rather than status codes. Open documents consume float just as jobsite delays do. As review cycles lengthen, schedule exposure grows even though milestone dates may not yet move. Measuring document delays against the float available in dependent activities identifies the items that matter most.

Administrative delays are schedule delays.

TRADE PARTNER SCHEDULE DRIFT

Tracking movement in forecast dates from one update to the next provides a measure of execution stability. Persistent drift indicates loss of recovery rather than isolated delays. Comparing forecast movement with production rates helps distinguish whether delays are caused by labor productivity, procurement issues, unresolved RFIs, predecessor slippage,

or trade coordination problems. Small date movements are normal. Persistent drift across updates or successive baselines is not.

A trade partner whose dates keep moving is drifting, not recovering.

PROJECT ADMINISTRATION AND CONTROLS

Financial and schedule metrics show what the project is producing and what it is costing. Project administration determines whether those metrics remain healthy. Work flows through documents, decisions, and accountability assignments. When those workflows slow, schedule and financial problems follow. Administration metrics are leading indicators. Schedule and financial metrics are lagging indicators.

DOCUMENT PROCESSING SPEED AND BOTTLENECK BY PARTY

Submittals, RFIs, and procurement approvals move through multiple parties before they are resolved. Tracking only open counts and aging hides where delays are actually occurring. Breaking response time down by the responsible party reveals where work is waiting and who owns the bottleneck. A design team delay requires a different conversation than an owner review delay or contractor backlog. Response times approaching SLA limits or responses consistently pushed to the end of the review window are early signs of capacity and workflow issues.

Documents do not become schedule risks because they are open. They become schedule risks because they stop moving.

ACTION ITEM AND NCR CLOSURE RATE

Action items, NCRs, and assigned decisions should be measured by closure rate and aging, tracked by responsible parties and trended over time. When open items accumulate faster than they are resolved, problems are building faster than they are being addressed. Aging action items with the owner indicate decision delays. Aging NCRs with a trade partner indicate unresolved quality issues. Aging decisions with the design team often become schedule impacts later.

Slow NCR closure deserves particular attention because deficiencies that remain open are more likely to be buried by subsequent work before corrective action is verified.

Problems do not become risks because they exist. They become risks when they remain open.

QUALITY

Schedule, financial, and administrative risks largely end at project closeout. Quality risk does not. Defects that escape detection during construction become the owner's problem long after the project team has left. Quality metrics focus on whether problems are being corrected while they are still inexpensive and whether specific trades are creating risks that will surface during closeout or years later.

REWORK-TO-CHANGE ORDER CORRELATION

Not all change orders arise from scope growth or unforeseen conditions. Some are associated with quality failures, trade conflicts, or work that required correction. Correlating NCRs, inspection failures, jobsite issues, T&M tickets, and change orders by trade, location, and timing reveals patterns that would otherwise remain hidden. The metric does not determine cause or assign blame. It identifies where rework may be contributing to cost growth and highlights areas that deserve investigation.

Correlation does not prove cause, but it tells owners where to ask questions.

INSPECTION PERFORMANCE: PRE AND POST

Inspection discipline is measured at two points. Pre-inspection readiness indicates whether work is truly complete when inspections are scheduled. Post-inspection clearance time measures how quickly deficiencies are corrected and approval is obtained after a failed inspection. Together, these metrics reveal execution and quality discipline more effectively than pass-fail rates alone and show how quickly the project recovers when problems occur.

Passing inspections matters. Recovering from failed inspections matters more.

TRADE PARTNER PUNCHLIST PROFILE AT 90% COMPLETION

The final 10 percent of a trade partner's scope is often the most difficult. Punchlist volume and closure rate once a trade reaches 90 percent completion provide an early

indicator of closeout risk. A trade partner carrying a large backlog with slow closure rates becomes more than a trade-specific problem. Unfinished work delays follow-on trades, commissioning, and final inspections. Tracking punchlist performance by trade partner provides a trade-by-trade forecast of closeout performance that is more actionable than a project-level substantial completion date.

The last 10 percent determines the last 100 percent.

Owners do not lose projects because information does not exist. They lose projects because the signals that matter are delayed, aggregated, or filtered. Financial metrics reveal misalignment between value and cost. Schedule metrics reveal loss of resilience before milestones slip. Administrative metrics reveal workflow friction. Quality metrics reveal risks that survive project closeout.

Together, these metrics form an Owner Intelligence Framework: a common operating picture that allows owners and owner's representatives to identify problems while they are still decisions, not claims, recovery plans, or warranty calls. 



About the Author

Shanthi Rajan is the Founder and CEO of [Linarc](#) in Los Angeles, Calif. She leads company strategy, product vision, and operations with a focus on solving complex field and coordination challenges in construction. Her role spans team leadership, customer engagement, and innovation in scheduling, workflows, and analytics. Shanthi is a frequent contributor to industry publications, writing on topics such as project controls, field productivity, AI in construction, and financial health indicators for contractors and trade partners.

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