

DESIGN, BUILD, LEARN, IMPROVE

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From Uncertainty to Evidence: Building Confidence in Product Development

Planning • Risk • Documentation • Testing

A project plan is not a prediction of the future. It is a mechanism for learning what we need to know before decisions become expensive. In this issue, we examine four connected disciplines: planning honestly under uncertainty, managing the risk of missing the intended outcome, preserving knowledge through useful documentation, and using testing, inspection, and evaluation to build confidence throughout development.

Strategic Project Planning Under Uncertainty

[By Steven G. Lauck Value Transformation LLC](#)

Most plans begin with dates, budgets, milestones, and resource assignments. Once entered into a schedule, these estimates can take on an undeserved air of certainty. Yet our understanding changes as the project progresses. A useful plan must change with it.

Start by separating facts from assumptions. Facts can be verified; assumptions are beliefs awaiting confirmation. Then distinguish decisions, experiments, commitments, and contingencies. A supplier selection is a decision; a prototype or pilot can be an experiment; a signed contract is a commitment. A contingency provides an option when the preferred path does not unfold as expected.

The distinction matters most before irreversible spending. We do not need perfect knowledge to move forward. We do need sufficient evidence to make a commitment proportionate to the remaining risk. Rather than only asking how to execute the schedule, ask: What can we do now to learn more before we spend more?

A credible plan makes uncertainty visible, assigns responsibility for learning, and adapts as evidence arrives. The objective is not certainty. It is better-informed decisions.

Mitigating Risk No. 1: Deliver the Expected Outcome

[By Steven G. Lauck Value Transformation LLC](#)

Finishing the work is not the same as delivering the expected outcome. A project can satisfy its schedule and still fail its customer, its intended use, or its business case. Risk management must begin with a shared definition of success and the real system in which the result must operate.

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Several lenses expose risks that a conventional probability-and-impact register may miss. Ontological questions ask whether we understand the actual system and its interfaces. Epistemological questions challenge what we know and what evidence supports it. Axiological questions expose competing values and tradeoffs. Methodological and logical questions examine whether our tests and conclusions are sound. Semantic and interpretive questions uncover disagreements about requirements. Experiential and execution-focused questions compare the written specification with customer experience and what people actually do.

Consider an ECU that passes component testing but depends on network traffic, power states, other ECUs, and particular software versions. Or a simulation predicting thermal performance without correlation to physical tests. These are not merely schedule risks; they are gaps in our understanding and evidence.

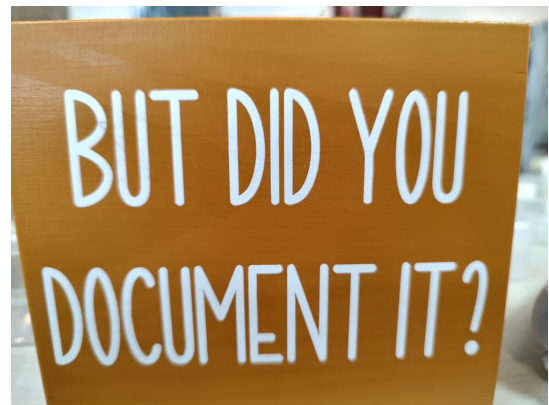
Translate the intended outcome into measurable acceptance criteria. Involve stakeholders and subject-matter experts early, define work products through the WBS and its dictionary, assign risk owners, review leading indicators, and test quality throughout the effort. A risk register is useful only when it changes decisions and action.

Document, Document, Document — Without Drowning in Files

By [Steven G. Lauck Value Transformation LLC](#)

Documentation is sometimes treated as overhead. Some of it is. But the real question isn't whether to document; it is what information must survive the meeting, the revision, the employee departure, and the next project.

Useful records include assumptions, decisions, approvals, issues, risks, change history, requirements, plans, contracts, and the rationale behind important tradeoffs. Meeting records should identify what was decided, who owns the next action, and when it is due. Revision control and document ownership are part of configuration management, not clerical decoration.



Retrieval matters as much as storage. Thousands of files scattered across local drives and inconsistent folders are not a functioning knowledge system. Naming conventions, accessible repositories, permissions, and a clear way to find the current approved version allow documentation to support execution.

The most expensive gap may be tribal knowledge. When an experienced maintenance employee retires, an undocumented machine workaround can leave with that person. Capture failures, corrective actions, unresolved problems, and the actual operating process—not merely the procedure we wish people followed.

AI and database tools can help organize and retrieve knowledge, but they do not replace accurate capture, accountable review, and configuration control. Documentation's value lies in what it enables the organization to learn and repeat.

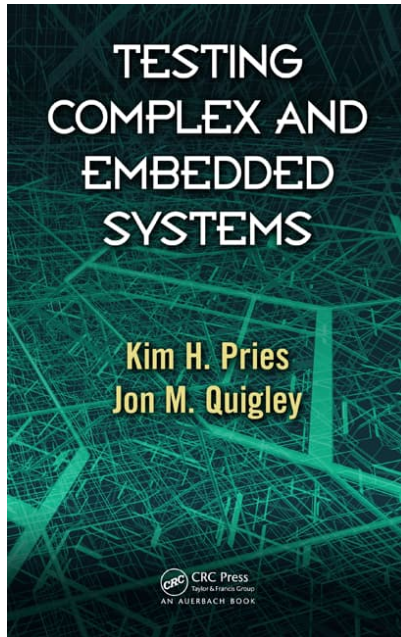
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Test, Inspect, Evaluate: Quality Begins Before the Prototype

By [Jon M Quigley, Value Transformation LLC](#)

Too often, teams schedule testing near the end of product development, when the cost of change rises, and launch pressure intensifies. Testing alone is also too narrow a quality strategy. Coordinate design and specification reviews, code inspection, model critique, prototype testing, and customer evaluation from the outset.



The Test, Inspection and Evaluation Master Plan Operations (TIEMPO) approach links these activities to defined product increments. Each hardware/software package has known feature content, a controlled baseline, and planned reviews and tests. The team can inspect requirements and test cases before physical parts exist; models and simulations can explore behavior earlier, provided their predictions are checked against real-world results. We treat this in depth in our book testing complex and embedded systems.

Verification asks whether the product meets its requirements. Validation asks whether it serves the intended customer need. Inspections challenge assumptions and defects in artifacts before they propagate. A complete strategy combines specification-based testing with boundary, extreme, multi-stimulus, and exploratory testing. DFMEA and PFMEA findings should inform what is examined, not remain isolated worksheets.

The result is a sequence of learning opportunities, not a last-minute pass/fail ceremony. Every build, review, and evaluation should increase our confidence in product and process readiness—or show us where confidence is not yet justified.

At Automotive Testing Expo North America — Novi, Michigan

[October 27–29, 2026 | Vibe Credit Union Showplace](#)

Jon M. Quigley will speak and moderate at Automotive Testing Expo North America, where the industry will examine advances in vehicle testing, validation, simulation, reliability, safety, and software-defined vehicles.

Moderated sessions

Wednesday, October 28 • 9:50 a.m.–12:10 p.m. — Next-generation testing technologies and practices

Wednesday, October 28 • 2:00–4:00 p.m. — Data-driven testing, reliability and safety

Thursday, October 29 • 9:50–11:30 a.m. — Testing and standards for cybersecurity, AI and SDVs

These conversations connect directly with this issue: how do we make technical uncertainty visible, collect defensible evidence, and translate test results into reliable engineering decisions? If you are attending, connect with Jon and join the discussion.

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Event information and registration: <https://testingexpo-usa.com/>. I look forward to seeing you there.

Closing Thought

Planning reveals uncertainty. Risk management determines where it matters. Documentation preserves the knowledge and decisions. Test, inspection, and evaluation produce evidence that the work will deliver the intended result. When these practices are connected, organizations learn earlier, commit more wisely, and improve product outcomes.

VALUE TRANSFORMATION | CLOSING NOTES

Better decisions depend on better evidence. Build the capacity to learn, preserve what you discover, and verify what you deliver.

Books, Training, and Consulting for Real-World Results

Selected books and reference works supporting product development, project management, embedded systems, configuration management, quality, risk, and automotive engineering.



About Value Transformation LLC

Value Transformation LLC helps organizations improve how they conceive, develop, test, launch, manufacture, and support products. We connect product and project management, systems engineering, supplier coordination, configuration management, quality, and testing so strategy becomes evidence-based execution.

From Concept to Production

Practical experience for complex products, regulated environments, multiple suppliers, and real-world delivery constraints.

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PRODUCT | PROJECT | QUALITY | TESTING | MANUFACTURING

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