

Independent Verification and Validation: An IT Insurance Policy that's Worth Its Weight in Gold

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Introduction

The Chief Information Officer (CIO) of your company has just launched a multi-million dollar initiative to either bring in additional revenue, cut costs, improve communication or introduce a new disruptive technology that will change the way we live, work, and play. You have been chosen and entrusted to bring the CIO's vision to fruition and manage it to success. You hire a top tier firm to develop the technology because they are the industry experts, however, you do not have the resources in-house to make sure that you are administering the proper oversight to keep the project on track, under budget, and compliant to the requirements. You also understand that you do not want to wait until the day of deployment to realize that you are not getting what you wanted and now you have to explain the results to the CIO. Well, polish off your resume because that is not the proper approach to making sure the project will be successful. So how do you avoid possible pitfalls? Let's explore a solution offered through Independent Verification and Validation (IV&V).

What is Independent Verification and Validation?

To understand what IV&V means, we must focus on the term “independence”. IV&V means a truly unbiased and separate entity evaluates the work products generated by another team, organization, department, and/or company that are designing, creating, or executing a project. The IV&V team will monitor and evaluate every aspect of the project from inception to completion and often times through operations and maintenance.

IV&V is an insurance policy worth its weight in gold. It is less challenging and more cost effective to correct problems that are identified early in the project versus at the end. Once an issue is discovered at the end of a project, a problem becomes a crisis. Even at the end of a project, it is far better to discover the issue at that time prior to production deployment.

An experienced IV&V team reviews all aspects of the project throughout the management process. The IV&V team will administer IT assessments, due diligence reporting, process and procedure audits, project management, software code reviews, and systems analysis and design.

Why is Independence Important?

The biggest benefit to engaging an IV&V team for project management support is the group is unbiased. There is no agenda or ulterior motive with their engagement and they can truly provide objective advice. IV&V organizations establish their reputation on helping clients avoid possible catastrophes. In addition to the objective nature of an IV&V team, an additional benefit is having another set of eyes to review project execution. As IT projects become more complex and the level of investment becomes larger, having a trusted advisory team will help in the evaluation of deliverables, risk mitigation, and issue resolution. An independent evaluator recognizes the warning signs that a project manager may not see and makes the proper recommendation on how to proceed.

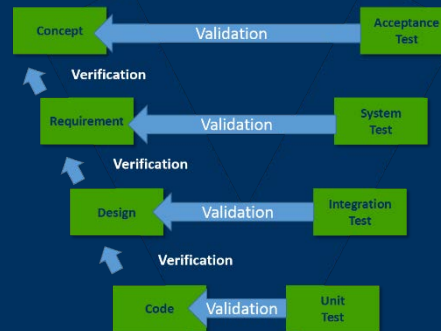
What Should You Look for in an IV&V Service Provider?

Organizations seeking the services of an IV&V firm should identify the entity as truly independent. The service provider should be excellent communicators with a deep level of subject matter expertise in a broad array of areas in IT including understanding the business climate of the client. The IV&V service provider will be asked to provide detailed analysis and communicate their findings and recommendations to technical or executive level personnel. The IV&V service provider will provide answers to the following questions:

- 1) Are there hidden problems that we maybe overlooking?
- 2) Is the project on track to meet the planned budget and task delivery?
- 3) Are we engaging in the most efficient process to develop this product or service?
- 4) Is the project likely to be successful?

Our Approach

Technology initiatives and programs should engage with an IV&V process at the project planning phase in order to receive an unbiased, impartial view into the project planning, scheduling, budgeting, and resources allocation. Early implementation of IV&V helps prevent cost overruns, schedule slippage, and scope creep by means of both preventive and corrective actions to mitigate risks, gaps, and issues. IV&V activities are performed concurrently with the Software Development Lifecycle (SDLC) to provide timely feedback to the technology project team to ensure the development and implementation of a quality software product and architecture.



We implement the following major IV&V phases:

Phase	Functional Description
Planning	Acquisition and business case evaluation
Requirements Verification	Requirements validation and requirements traceability matrix evaluation
Design Verification	Requirements validation and requirements traceability matrix evaluation
Development	Code verification and software/unit component testing
System Validation	Functional, performance, technical, conversion, and data-cleansing validation
System Implementation	Readiness for production roll-out
Operations and Support	Requirements management and system modifications

Our IV&V approach and methodology is the verification and validation of each phase of the SDLC. IV&V activities take place separate from but in concert with the SDLC stages. By evaluating the programs progress at each phase-gate, our team can gauge future risks and make suggestions for corrective action during the process. Each checkpoint activity is to confirm the requirements defined for that activity satisfies its intended use.

Planning

The IV&V team reviews all the project deliverables—including project business cases, project plans and schedules, costs, the work breakdown structure (WBS), the configuration/change management (CM) plan, the quality control/assurance (QC/QA) plan, and data management plans—to determine whether they are realistic and can be implemented within the available resources and constraints. The team screens and cross-references all project deliverables against preliminary system requirements documents to detect such things as issues, shortfalls, errors, and discrepancies.

Requirements Verification

The team will proactively understand the business needs of the organization. We will meet with end users to understand their expectations, goals, and objectives. When the Functional Requirements Document (FRD) is finalized, our IV&V team will administer a review and compare it to the information gathered

through joint working sessions with the end user to ensure that the system requirements written in the FRD cover all of the users' needs and are implementable and testable.

Design Verification

Our IV&V team reviews the system design document (SDD) to determine whether all the system physical and logical designs are implementable as well as testable.

Development

Our IV&V team inspects the source code to ensure that it meets the coding standards, and correctly and completely implements all the specified system requirements.

Testing

Our IV&V team administers system validation utilizing three (3) activities:

- 1) **System Readiness Assessment** - Our IV&V team assesses, via the Test Readiness Review (TRR) meetings, the system readiness for the unit, subsystem, and system integration tests to be performed by the development team. Our IV&V team develops TRR checklists to track the progress.
- 2) **Test Monitoring** - The unit, subsystem, and system integration tests performed by the development contractor are monitored by the IV&V team to ensure that these tests are executed in accordance with the approved test plans and procedures. All testable requirements are accounted for and are mapped to corresponding test cases in a requirements traceability matrix (RTM) and the test results, testing status, and anomalies are recorded and documented in a test analysis report (TAR).
- 3) **Independent Testing and Evaluation (ITE)** - Our IV&V team will perform ITE to verify that all system requirements, such as functional, operational, performance, and interface requirements, are met and to detect system anomalies for correction before the system is deployed. The team develops an ITE test plan to describe all planning steps, testing resources, and timelines. Step-by-step IV&V test cases are also developed and mapped to the system requirements at this time for tracking purposes.

The team executes the IV&V test cases to obtain the actual output produced by the system under test when the defined input is fed into the system. The actual output is evaluated and compared with the expected output to determine the system behavior. Our team also will provide the Test Problem Reports (TPR) when anomalies are detected.

Deployment and System Implementation (Operations and Maintenance)

Our team reviews the implementation and deployment plans for quality assurance purposes and attends any Production Readiness Review (PRR) meetings to determine whether the system is ready to be deployed in accordance with the implementation and deployment plans.

In Summary

Our time tested IV&V methodology should be considered as a relatively low-cost insurance policy at the outset of any software development project. This oversight ensures that the developers can meet all

program plans, schedules, and deliverables with fewer hidden errors, issues, and anomalies, thus lowering the risk of unexpected cost and schedule overruns. Our IV&V team's findings will be unbiased and truthful because the team is financially, technically, and managerially independent.

About the Author



Keith L. Scott is the President and CEO of K.L. Scott and Associates. He has over 24 years of IT Strategy and Management Consulting experience leading project initiatives in the public and private sectors. Mr. Scott is a practice and thought leader in IV&V and business advisory services. He has published many articles such as “A Day in the Life of a Process Consultant”, “Tips for Managing Virtual Teams”, “Positioning Your Organization for Change”, and “The Importance of Process”. Mr. Scott is not only an implementer and evaluator of IV&V best practices, he is also a contributor. Through his vast experience across many industries, Mr. Scott has provided clients with repeatable checks and balances initiatives to ensure compliance to client goals and objectives. Under his leadership, he has provided professional services to public sector clients such as U.S. Department of Education, U.S. Department of Homeland Security, U.S. Department of Veterans Affairs, Atlanta Public Schools, Michigan Department of Education, Kentucky Department of Education, Metropolitan Atlanta Rapid Transit Authority (MARTA), and Texas State University – San Marcos. In addition, his leadership in the private sector serves clients such as Delta Airlines, AIG, Chick-Fil-A, Inc., Autotrader.com, and AT&T. He holds a Bachelor of Science in Computer Science from North Carolina A&T State University and a Masters of Business Administration in Strategic Management from Mercer University.

Let Us Help You!!!

Call us today for a FREE initial consultation. IV&V services are an insurance policy you cannot afford to be without. We will ensure the results that you expect and require.

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