Independent Verification and Validation

Using IV&V to reduce risks and increase confidence in project success

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EY
Building a better working world

Topics

- What is IV&V?
- Current business environment
- Typical business challenges with major transformation programs
- Common causes of project failures, their impacts and lessons learned
- How IV&V can improve the outcome of complex initiatives
- IV&V review elements

What is IV&V?

- Independent Verification and Validation (IV&V) is the process of checking that a product, service, or system meets specifications and that it fulfills its intended purpose.
  - Is the thing being built right?
  - Is the right thing being built?
- According to the PMI *PMBOK Guide – Fifth Edition*:
  - Project Quality Management works to provide confidence that the project requirements, including product requirements, are met and validated.

What is the same?	What is different?
► Focused on project health and improvement ► Focused on project success	► IV&V – Independent of the project ► Not influenced by the “spin” or “opinion” ► QA/QC – Integrated into the project

Current business environment

Global trends challenging traditional business models
Necessitating successful transformation for survival

Current environment

Market observations

- Deregulation
  - Access to new markets and finance
  - New entrants and competitors
- Globalization
  - Expansion of product/service portfolio
  - Growing size and diversity of customer base
  - Inter-connection and interdependence across regions and functions
- Emerging markets
  - Commoditization and offshoring of products and services
  - Customization of delivery models to suit new markets
- Rapid technology innovation
  - Proliferation of cloud and mobile solutions
  - Impact of social media on sales and marketing

Business imperatives

- Maximize financial returns from initiatives/projects
- Optimize capital investments in initiatives/projects
- Better evaluate and prioritize initiatives/projects
- Better align projects with the corporate and business strategy
- Better measure the performance of the portfolio and individual programs
- Better balance risks and rewards
- Improve project performance visibility and predictability of benefits
- Allocate resources effectively to drive productivity

Increasing complexity and constraints of doing business
Balancing transformation with business as usual

Current environment

Organizations have embraced the need for transformation, but execution continues to produce disappointing results due to increased complexity and constraints.

- Complexity:
  - Greater uncertainty and risk
  - Relentless speed of change
  - Industry convergence and regulatory change
- Constraints:
  - Limited capital to achieve strategic objectives
  - Fixed or fewer resources to deliver value
  - Lack of a forward-looking view on risks

- The results:
  - Increased project cost
  - Increased project time
  - Decreased benefit realization
  - Lengthened time and unplanned cost allocations to achieve benefits

Approximately USD $682B wasted spend per year globally on underperforming or cancelled projects.

17% of IT projects go so bad that they can threaten the very existence of the company.

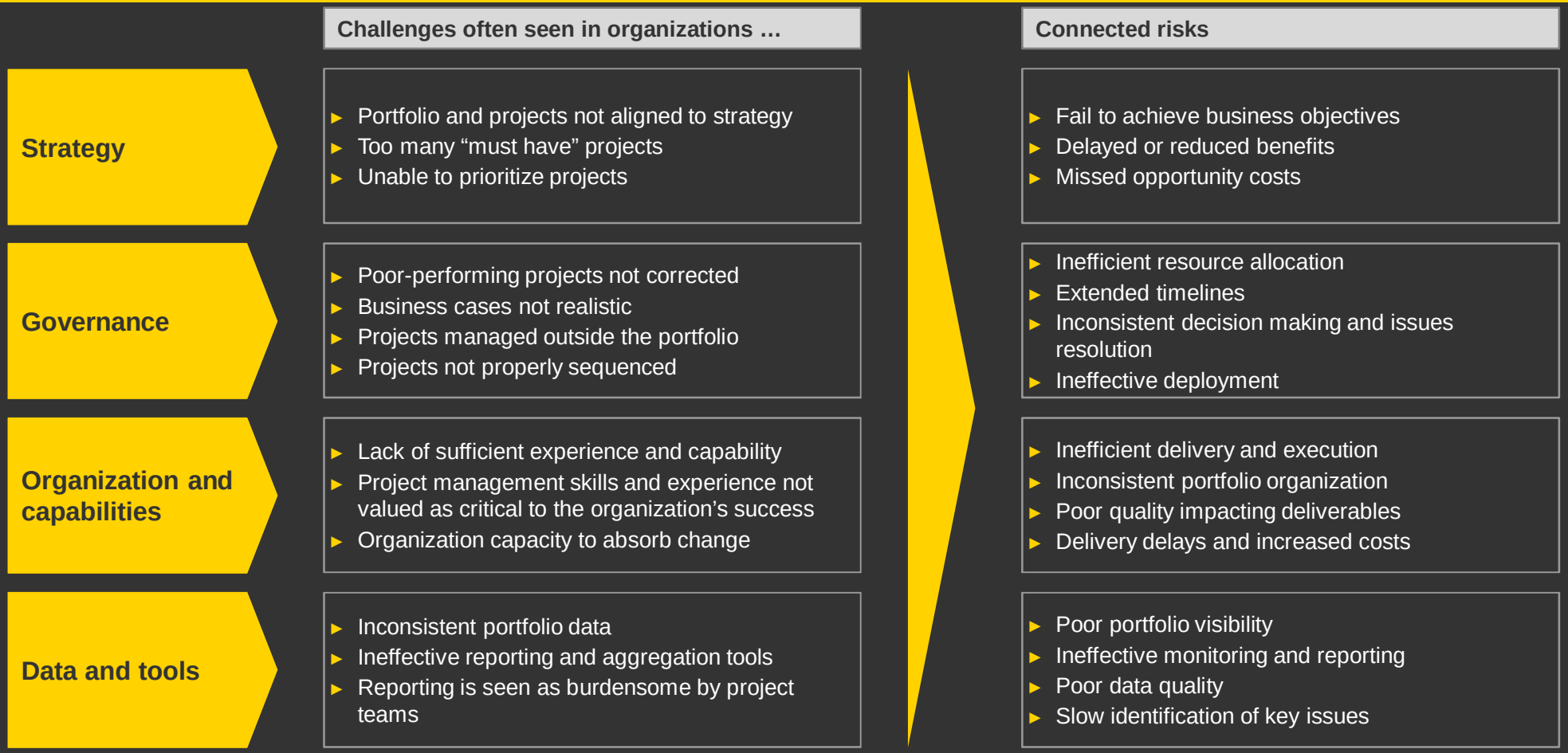
Sources: National Institute of Science & Technology, Gartner, Forrester, CIO Magazine, The Standish Group, Steven's Institute of Technology, MORI Captains of Industry, EY CBK, Dept. of Trade & Industry

*Note: Global spend is between US$760B and US$1,033B. The average of US$1,050B was used and is the basis of analysis.

Typical business challenges with major transformation programs

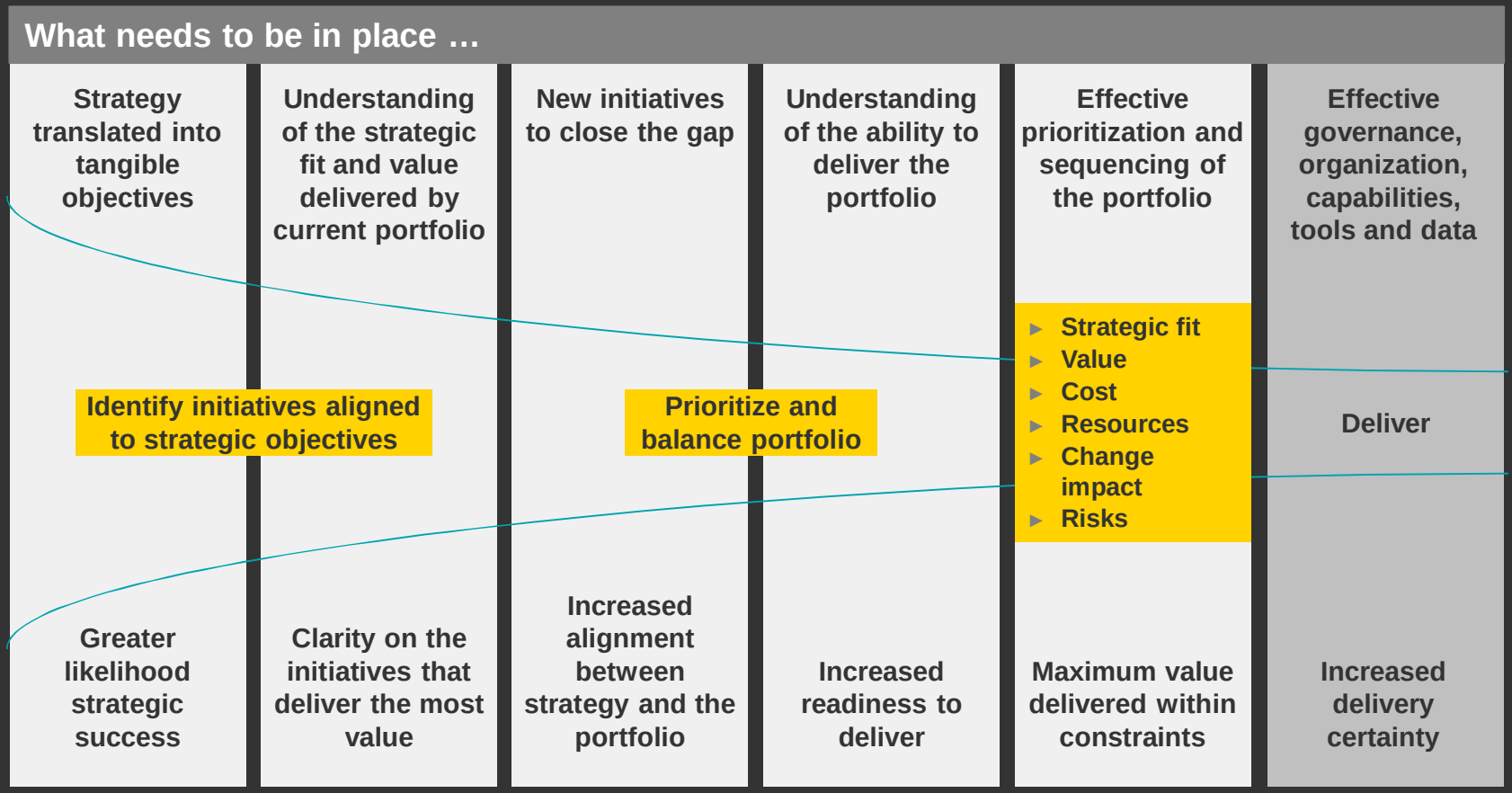
Common factors affecting portfolio and program performance

Business challenges



Successfully addressing these challenges can create significant value for an organization

Business challenges



Common causes of project failures, their impacts and lessons learned

Typical project scenario:
All projects are green…. until they are red

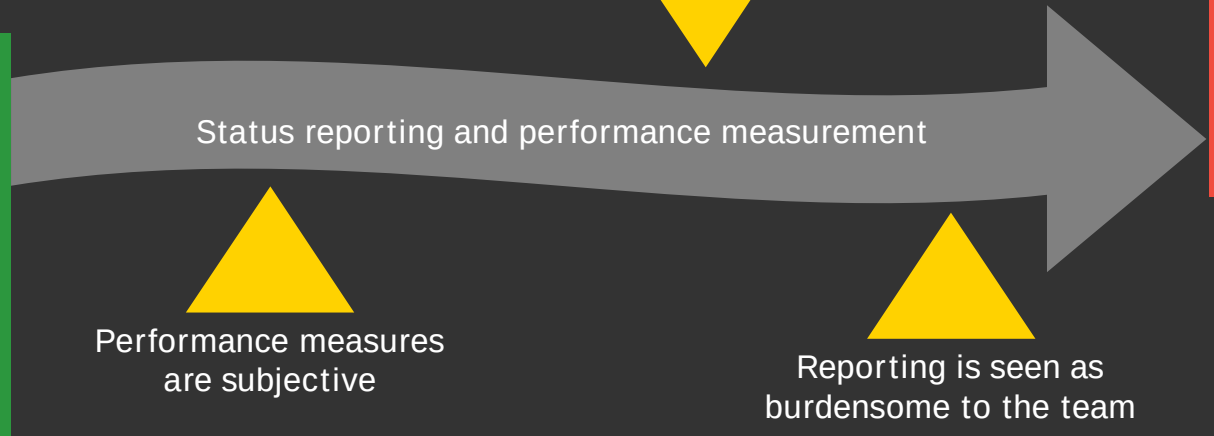
Project failures

Common occurrence

Activities are reported as being Green until just before the due date when their status is turned to Red.

Why does this happen?

What is the effect on the program?



Typical response

Extend the milestone or delivery date, because there was not enough of an early warning indicator to allow for any other response.

Common causes of project failures

Rank	Item Description*	Source	Mean Importance Score
1	Lack of top management support or commitment to the project	Schmidt et al., 2001	6.59
2	Functional, performance, and reliability requirements and scope are not documented	Winters, 2002	6.58
3	Project manager(s) cannot effectively lead the team and communicate with clients	Schmidt et al., 2001	6.38
4	No change control process	Schmidt et al., 2001	6.33
5	Project stakeholders have not been interviewed for project requirements	Ward, 2003	6.32
6	No documented milestone deliverables and due dates		6.30
7	Undefined project success criteria		6.22
8	Project team members have weak commitment to the project scope and schedule	Schmidt et al., 2001	6.17
9	Communication breakdown among project stakeholders	May, 1998	6.17
10	Key project stakeholders do not participate in major review meetings		6.16
11	Project team members do not have required knowledge/skills	Barki et al., 2001	6.16
12	Project resources have been assigned to a higher priority project	Havelka et al., 2004	6.12
13	No business case for the project	Ward, 2003	6.11
14	No project status progress process	Havelka et al., 2004	6.11
15	Schedule deadline not reconciled to the project schedule		6.09
16	Early project delays are ignored — no revision to the overall project schedule	McKeeman, 2001	6.04
17	Subject matter experts are overscheduled: retain all prior duties yet expected to provide substantial participation to the project	McKeeman, 2001	6.04
18	No planning and estimation documentation	Jones, 2004	5.96
19	Project managers have poor training	Schmidt et al., 2001	5.94
20	Key stakeholders do not review and sign off deliverables on a timely basis		5.93
21	Project stakeholder decision delays have caused due dates to be missed		5.93
22	No due diligence on vendor(s) and team members	McKeeman, 2001	5.91
23	No written commitment for the project outside of the project team		5.88
24	Significant goal, scope, or schedule requirements change immediately after project kickoff	Boehm, 1991	5.85
25	Team members have undefined roles and responsibilities	Jiang et al., 2002	5.83

Source: Early Warming Signs of IT Project Failure: The Dominant Dozen by Leon A. Kappelman, Robert McKeeman, and Lixuan Zhang

What are the impacts of a bad project?

Project failures

- Loss of expected return on investment
- Loss of competitive advantage
- Fines from failed regulatory compliance
- Loss of revenue
- Negative impact on reputation
- Delays in deploying key products or processes
- Loss of critical business and IT personnel
- Loss of shareholders and investors
- Disruption of service to customers

Case study:
Denver airport baggage

Original plan

- Scope:
  - 88 airport gates in three concourses.
  - 17 miles of track and 5 miles of conveyor belts.
  - 3,100 standard carts + 450 oversized carts.
  - 14 million feet of wiring.
  - Network of more than 100 PC's to control flow of carts.
  - 5,000 electric motors.
  - 2,700 photo cells, 400 radio receivers and 59 laser arrays.
- Original Budget - $186 million.
- Project started in November 1989.
- Project target completion in October 1993.

Results

- Total Spend – $461 million ($275 million variance).
- Project actual completion in February 1995 (14 months late).
- Project delays cost the city $1.1 million per day.
- At project completion, the system was a shadow of its former scope:
  - System used by only one concourse as opposed to all three.
  - System was only used by a single airline and only for outbound flights.
- All other baggage handling was performed by simple conveyor belts plus a manual tug and trolley system.
- After 10 years, the system was finally abandoned in 2005.

Causes

- Change in strategy and scope creep.
- Project complexity and size underestimated.
- People working in silos and not involving stakeholders.
- Lack of planning and due diligence.
- Architectural and design issues.
- Poor management oversight.
- Ineffective communications.
- Poor risk management.
- Leadership change.
- Excessive schedule pressure.

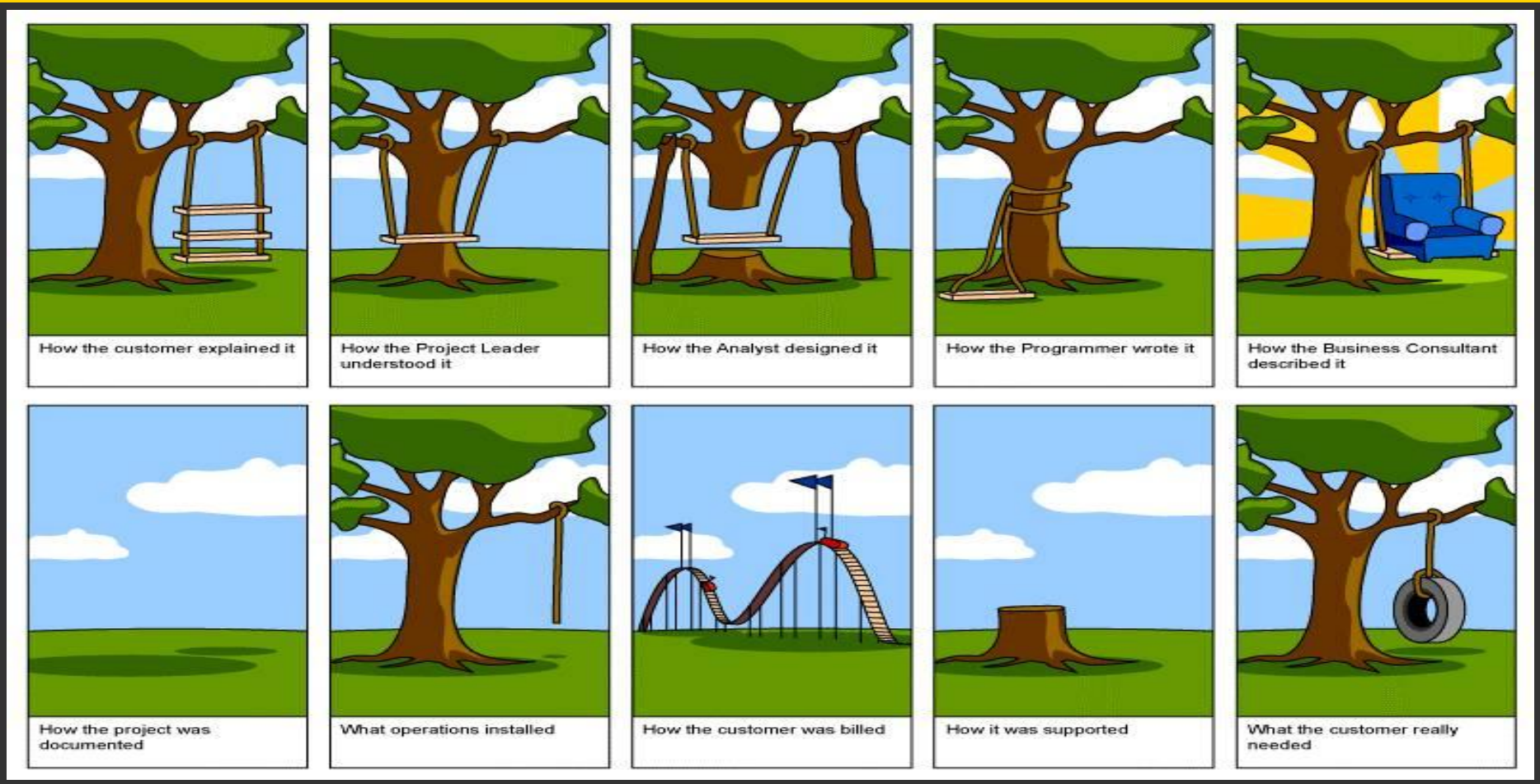
Top 10 lessons from troubled programs

Project failures

Install the right leadership and form the right team with continuity	Assign experienced leadership and establish a team that covers the requirements with balance and cohesion for the program lifecycle.
Design the proper governance and decision making	Design and execute a governance framework that is commensurate to the complexity of the program with clearly delineated roles and responsibilities.
Use the right methodology and program processes	Employ a proven implementation method appropriate to the design objectives of the program, adapting the program approach accordingly.
Develop requirements, understand uncertainty and acceptance criteria	Determine requirements, understand uncertainty by requirement, priority drivers, talent matched, estimated and then tenaciously manage scope.
Take the time to properly plan	Develop schedules that contain the proper degree of rigor, are logically correct with clear understanding of the critical path of activities.
Define budgets according to the context	Develop budgets that factor in team capability, environment, quality and size and then implement appropriate cost management practices.
Establish effective stage-gate criteria and governance	Direct, design and implement a quality management plan and stage gate assurance process. Know when to terminate programs. Earlier is better.
Design and execute to a fully developed risk management plan	Establish start-up and forward looking view on risks, determine risk response actions, map risks to the schedule, show impacts and monitor.
Know where you are and develop a basis for level of confidence	Design and execute to a performance management plan that provides program situational awareness and transparency to all governance levels.
Get an independent expert opinion	Conduct objective, fact-based reviews at key points in the program.

How IV&V can improve the outcome of complex initiatives

Typical IT project

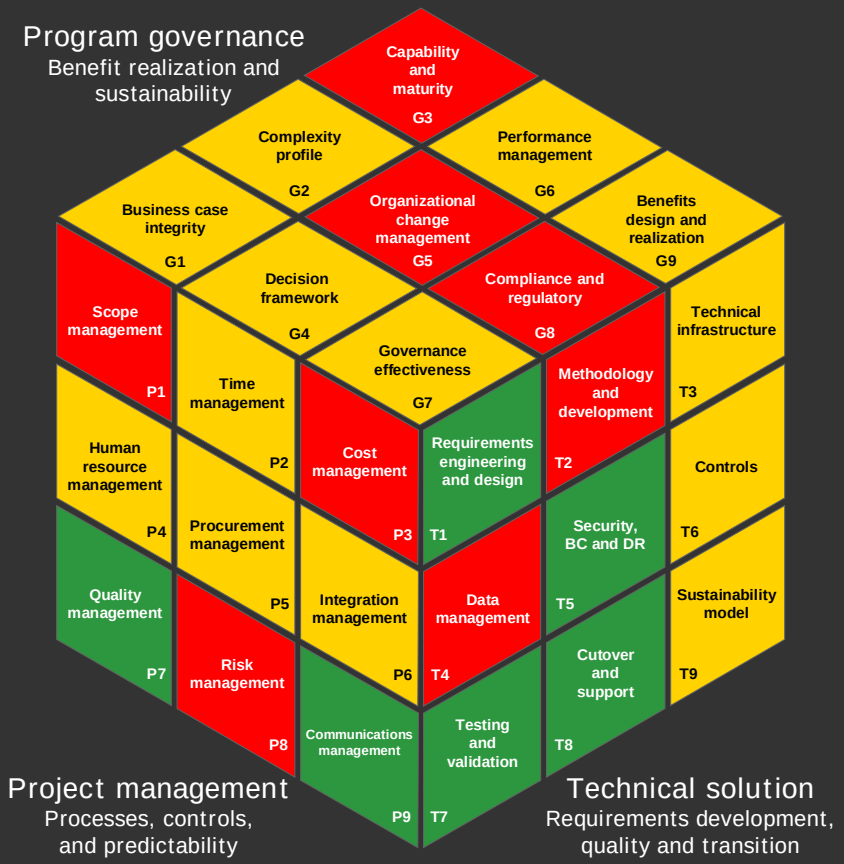


What is IV&V?

- Independent Verification and Validation (IV&V) is the process of checking that a product, service, or system meets specifications and that it fulfills its intended purpose.

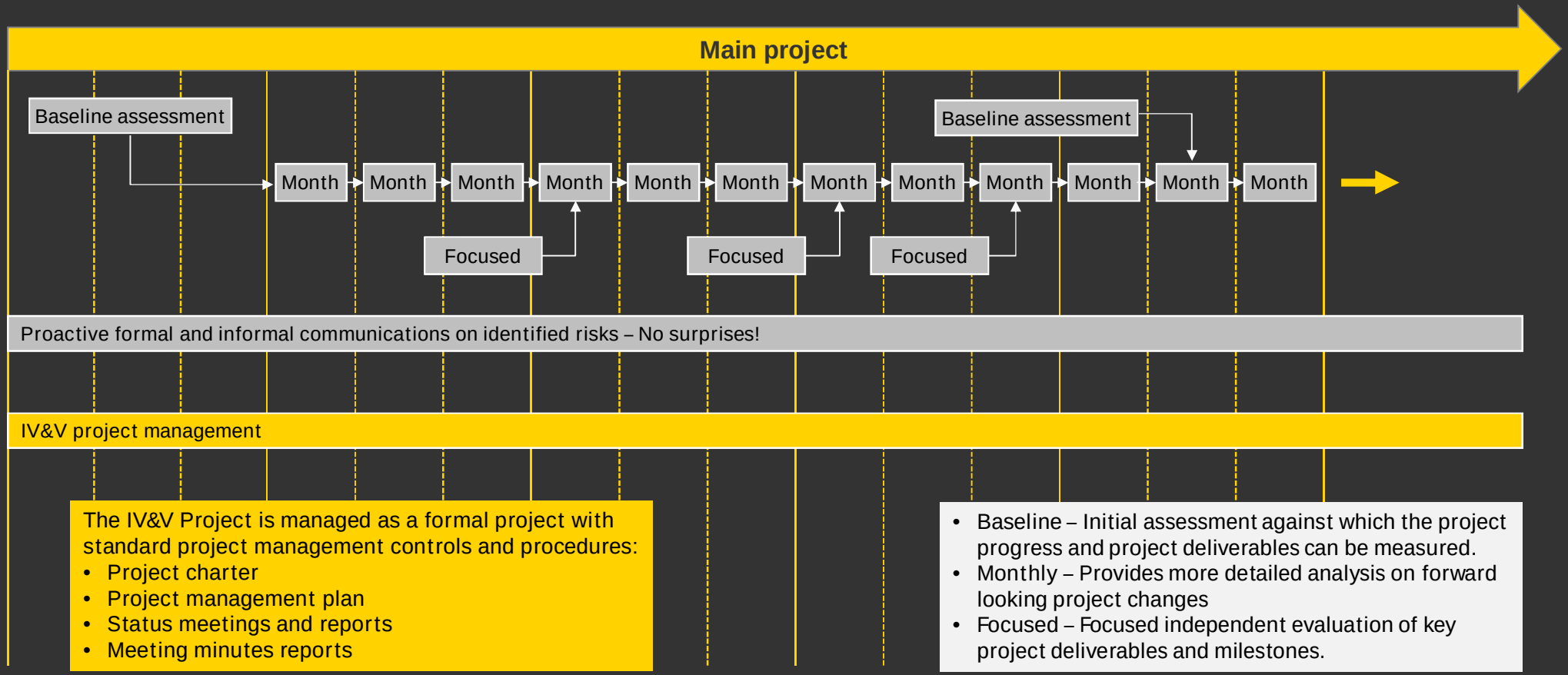
Independent	• IV&V services must be provided, managed and financed by organizations that are technically, managerially and financially independent of the development project.
Verification	• Verification is a Quality control process that is used to evaluate whether or not a product, service, or system complies with regulations, specifications, or conditions imposed at the start of a development phase. • Is the thing being built right?
Validation	• Validation is Quality assurance process of establishing evidence that provides a high degree of confidence that a product, service, or system accomplishes its intended requirements. • Is the right thing being built?

IV&V review framework



Dimension	Description
Program governance	▸ Specifies the decision rights and accountability framework to encourage the desired behavior in the organization necessary to achieve program objectives. ▸ Identifies who makes decisions (power), why they make them (alignment), and how they make them (decision process). ▸ Establishing an aligned and effective program governance process requires integration of key foundational and operational elements such as complexity management, decision framework and empowerment, and governance process effectiveness.
Project management	▸ The project management approach and performance maturity must be aligned with the inherent program complexity. ▸ Without this, the program will lack appropriate visibility and predictability into achieving the expected outcomes.
Technical solution	▸ The assessment of the technical solution dimension provides a better understanding of the technical implementation approach, decisions and current state stability of the project.

Typical IV&V approach

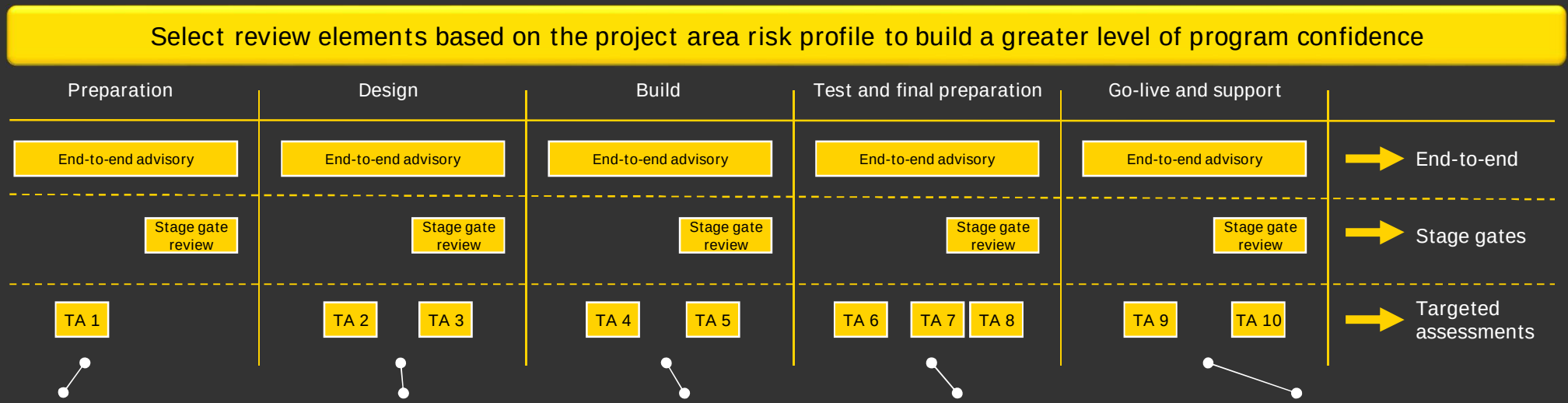


The IV&V Project is managed as a formal project with standard project management controls and procedures:

- Project charter
- Project management plan
- Status meetings and reports
- Meeting minutes reports

- Baseline – Initial assessment against which the project progress and project deliverables can be measured.
- Monthly – Provides more detailed analysis on forward looking project changes
- Focused – Focused independent evaluation of key project deliverables and milestones.

Aligning IV&V reviews with the project lifecycle



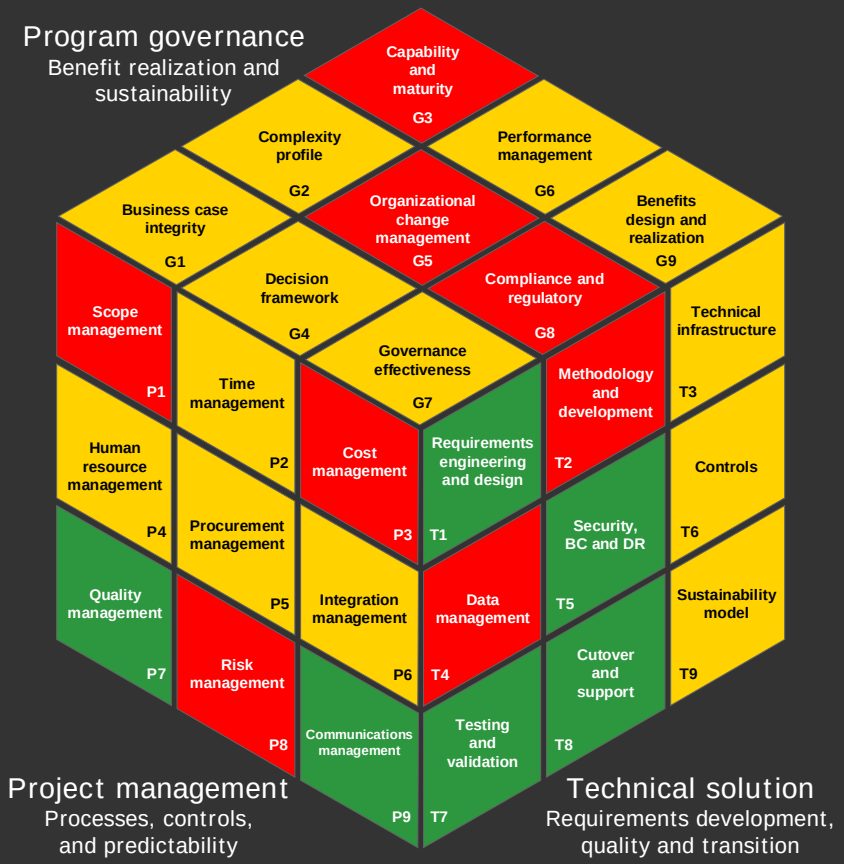
Benefits of IV&V

- √ Increased confidence in the integrity of business case and projected benefits.
- √ Increased likelihood that the program will be delivered on time, on budget and with projected benefits.
- √ Improved visibility and transparency of program risks and performance.
- √ Early identification of program critical risks and issues.
- √ Practical solutions to address problems as they arise.
- √ More informed decision-making as a result of independent reporting.
- √ Access to independent professional advice on leading program practices.
- √ Enhanced management control of the program.
- √ Reduced unwanted surprises.
- √ Improves organization's maturity and capability in executing large, complex programs.

IV&V review elements

Assessment framework

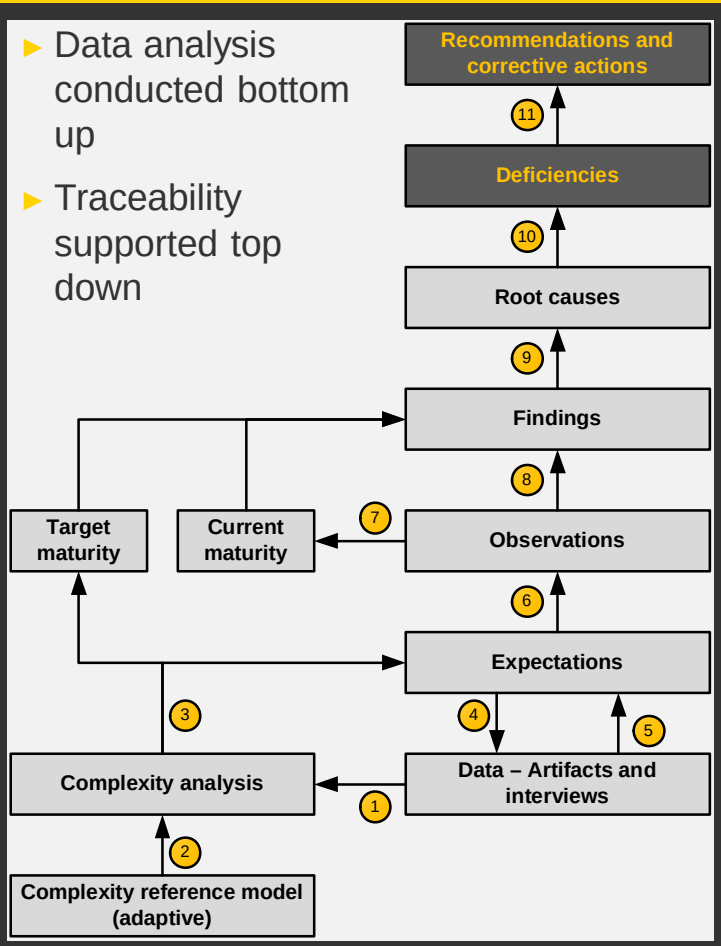
IV&V review elements



- Each area includes the following:
  - General description and risks.
  - Expectations for level of incorporation of the facet into the program based on complexity.
  - Maturity descriptions comprised of five levels of maturity (initial, repeatable, defined, managed and optimized).
  - Applicable industry leading practices and standards.
  - Standard documentation typically associated with the defined expectations for the facet.
  - Interview topics to be discussed during interviews with key stakeholders.

Analysis data hierarchy and relationships

- Data analysis conducted bottom up
- Traceability supported top down

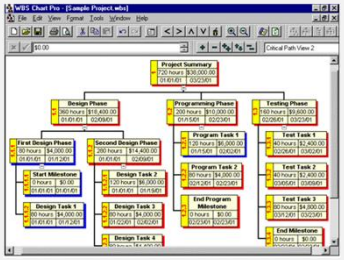


- Complexity determines expectations and target maturity to appropriately manage risk.
- Expectations determine artifacts to be collected and interviews to be conducted.
- Observations are made based on collected data (artifacts and interviews) and the expectations.
- Findings are derived from observations.
- The root cause analysis determines the root causes (positive and negative) that are driving overall project performance.
- Deficiencies are derived from the negative root causes.
- Recommendations and corrective actions are developed for identified deficiencies.

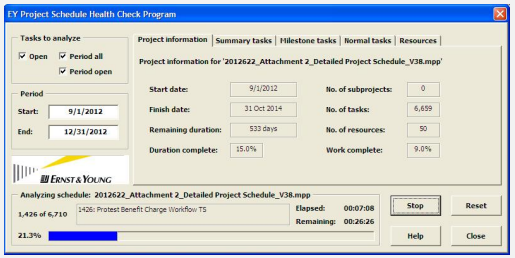
Supporting tools and enablers

IV&V review elements

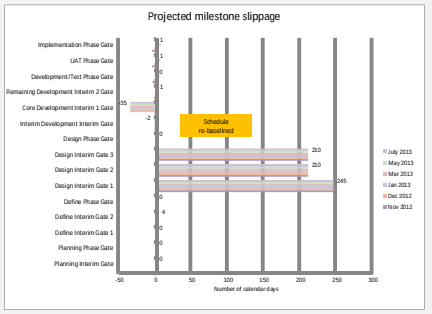
Advanced tools that provide detailed analysis data to support IV&V analyses.



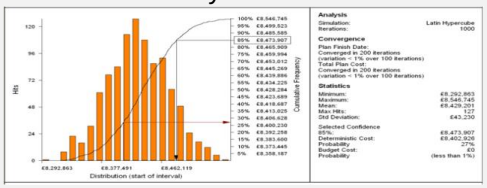
WBS analysis



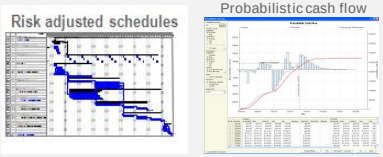
EY Project Schedule Analysis Program



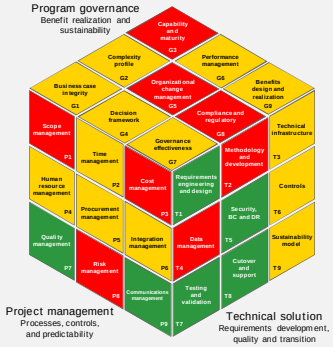
Project milestone analysis



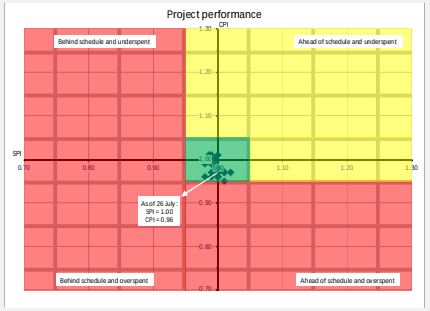
Quantitative schedule and cost confidence simulation



Risk-adjusted scheduling and cashflow forecasts



The cube program risk framework



Project performance metrics analysis

Questions?

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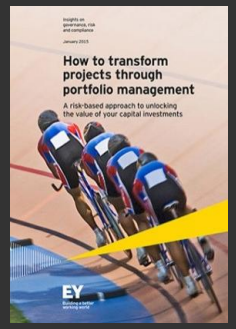

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How to build confidence in IT programs: unlock the value of your capital investment through proactive program risk management.

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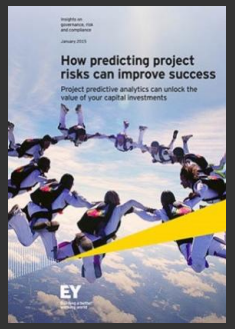

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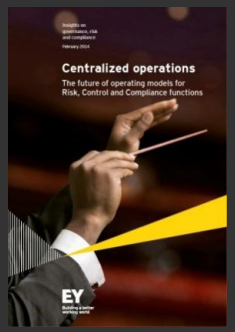

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- Gary Didio is a Senior Manager with Ernst & Young LLP and has more than 35 years' experience helping organizations produce positive results and achieve desired business outcomes through effective program management.
- He has been instrumental in organizing and leading full lifecycle, multi-disciplinary projects, conducting independent program reviews to assess the effectiveness of client's program and project management frameworks, establishing and running Program Management Office (PMO) activities and related communications and change management processes, and establishing full lifecycle independent verification and validation (IV&V) offices advising Clients on multi-year business transformation initiatives.
- Gary has been globally recognized for delivering project management excellence both within Federal and State government, as well as in the private sector.

Educational and certifications

- BS in Physics; Rensselaer Polytechnic Institute
- Project Management Professional (PMP) certification
- Member of the Project Management Institute (PMI) and American Mensa, Limited
- Received the PMI 2011 Distinguished Project Award

Award winner for 2011 PMI Distinguished Project Award

Risk consulting market leader by industry analysts, such as Gartner and Forrester

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