The path to assurance: an analysis of project performance methodologies

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The Path to Assurance: An Analysis of Project Performance Methodologies

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Abstract

Without specialized management, capital projects are at risk of cost overruns, delays, and failures. The need is greater than ever for careful oversight, especially for projects with multiple funding sources. Performance audit is commonly a requirement on many types of projects, yet current approaches to establishing the scope of capital performance audit are highly variable, and formal standards exist but are known to focus on engagement (not project) management. Economy, efficiency, and effectiveness, integral to the definition and expectations of performance audit, are rarely addressed in practice.

Building on previous exploration of key elements and scopes of performance audit, this paper looks to existing published guidance in project assessment, with the goal of identifying from these methodologies key elements that may be helpful in defining a new, flexible, and portable methodology for effective project and program performance audit.

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1. Introduction

Without specialized management, capital projects are at risk of cost overruns, delays, and other failures. Project managers and owners take many different approaches to stewardship; the concept of stewardship implies more than just day-to-day oversight and management of issues, and includes concepts of fiscal accountability and assurance to stakeholders.

Traditionally, financial audit can be understood as an examination of accounting records undertaken to establish whether they completely and correctly reflect the transactions for the related purpose. In addition, the auditor also expresses his opinion on the character of the statements of accounts prepared from the accounting records so as to whether they portray a true and fair picture of the financial affairs (U.S. Government Accountability Office, 2007). The issue that is explored in this paper is the extent to which performance audit can result in an informed opinion on the true and fair picture of the status of the capital project under consideration. As such, performance audit is closer to the practice of organizational evaluation than financial audit.

This paper interprets the GAGAS standards that relate to performance audits for capital (construction) projects (U.S. Government Accountability Office, 2007). The research considers previously identified insufficiencies in capital program performance audits, and looks to published guidance in other areas of project performance assessment, such as Value for Money (VfM) assessments, project health checks, key performance indicators (KPI) and critical success factors (CSF), and stage gate (gateway) reviews. Each of these methodologies have identified elements to be included in a flexible and portable methodology for appropriate project assessment. The objective, in developing a new performance audit methodology, is to truly enable performance audit as a mechanism for stewardship and continuous improvement of capital projects.

2. The Performance Audit Challenge

One of the most common statutory and regulatory oversight mechanisms required on projects is audit, both financial and performance. Note that financial auditing focuses on accounting and fiscal regularity, whereas “performance auditing is a systematic, objective assessment of the accomplishments or processes of a government program or activity for the purpose of determining its effectiveness, economy, or efficiency” (Waring & Morgan, 2007).

An operations audit is an examination of the operations of the client's business or a department. In this process, the auditor thoroughly examines the efficiency, effectiveness and economy of the operations with which the management of the entity (the client) is achieving its objective. The operational audit goes beyond internal controls review, since management does not achieve its objectives merely through compliance with policies and procedures, and internal controls. Operational audits cover any matters that may be commercially unsound. The objective of operational audit is to examine the “Three E’s” (Waring & Morgan, 2007), namely:

- Economy – undertaking the work with least wastage of physical and financial resources (inputs)
- Efficiency – performing work productively, with a high ratio of inputs to outputs
- Effectiveness – extent to which business and stakeholder objectives are met (outputs)

A control self-assessment is commonly conducted in an operations audit. However, audit benefits are best achieved through external examination. Operations audits need to be done by objective outsiders. A project performance audit is, essentially, an operations audit of a specific project’s status, and the project management organization for that project. Performance audits may be conducted for capital projects, or capital programs that involve multiple projects.

In practice, approaches to and scope of capital project performance audit vary wildly. Part of this is because, unlike compliance and financial audit, for project performance audit there is a near-complete absence of formal oversight body (Sloan, 1996), government or industry standards (Holmquist & Barklund-Larsson, 1996), and
published guidance. Even the three E’s of economy, efficiency, and effectiveness, which are integral to the
definition and expectations of performance audit, are rarely addressed in practice, largely because universal
definition and measures do not exist (Kestenbaum & Straight, 1995). There are no journals devoted to performance
auditing, and the available literature on project performance audit is scarce.

In the United States, “most state legislative audit staff follow the general guidelines set down in the GAO’s
[Government Accountability Office] ‘Yellow Book’, Standards for Audit of Governmental Organizations,
Programs, Activities, and Functions (U.S. Government Accountability Office, 2007). The Yellow Book covers
standards for audit work such as staff qualifications, planning, supervision, evidence, reporting, and review”
(Brown & Craft, 1980). Because this is the language most familiar in the audit world, and due to GAGAS
requirements, many public RFQs and RFPs also specify these as requirements, and also require that the work be
donducted or overseen by a CPA (certified public accountant). However, GAGAS, and its European peer
(INTOSAI Auditing Standards Committee, 2004) are insufficient for performance audit purposes as they contain
only audit engagement guidance (such as managing audit staff, minimizing risk to the audit firm, and documenting
audit findings), and do not contain any methodology for scoping and techniques specific to project performance
auditing. It has often been noted in the discipline that “…these [GAGAS] standards are too closely related to
financial auditing practice and are, therefore, inapplicable to many program evaluation situations” (Davis, 1980).
These challenges are even noted within the INTOSAI document itself: “Performance audits deal with a multitude
of topics and perspectives covering the entire government sector, and it would not be possible to develop detailed
standards and procedures that work equally well in all these situations…they operate from a quite different
knowledge base to that of traditional auditing. It is not a checklist-based form of auditing” (INTOSAI Auditing
Standards Committee, 2004). In fact, the concept of “performance” audit has also given rise to debates about where
to draw the line between auditing the implementation of program objectives and auditing the effectiveness of
program objectives (Pollitt et al., 1999).

Further, while participation by a CPA may be beneficial in reviewing project cost accounting data, and even
though GAGAS requires that audits be overseen by a CPA, accountants lack the in-depth industry knowledge to
adequately assess the concepts of economy, efficiency, and effectiveness on capital projects or programs. Indeed,
failure to include technical subject matter experts on the audit team may be a violation of GAGAS. The practice of
performance auditing is essentially unregulated, and continues to evolve as a profession. In a study by the author of
capital program performance audits, a sample of 390 audits conducted in the United States were examined,
determining the following (Nalewaik, 2012):

- 100% of the performance audits evaluated compliance with funding source requirements
- 85% of the performance audits reviewed expenditures for compliance with the contract
- 80% of the performance audits included a comparison of policies, procedures, controls and management against
  a checklist of industry best practices
- None of the performance audits explicitly evaluated economy, efficiency, or effectiveness
- None of the performance audits used a risk assessment as a basis for elements to be audited

From the study above, it can be concluded that compliance is ingrained in audit culture. However, the results
generated from compliance audit more frequently surface human error than fraud, such as math and coding
errors, which are likely immaterial. These detract from the purpose of the performance audit; fault-finding and
reporting on exceptions is counterproductive (Shand & Anand, 1996), by unnecessarily focusing stakeholders’
attention on clerical mistakes instead of broader problems of performance. Until oversight, training, and published
methodologies exist, the compliance element of performance audit will continue to fail in the mission to provide
assurance to stakeholders.

Since the completion of the 2012 study, a new performance-auditing standard was published in March 2013 by
the European Court of Auditors (ECA). Although the majority of the new standard focuses, as did GAGAS and
INTOSAI, on engagement process, the new standard is the first to identify evaluation elements that should be
included as part of performance audit scope. The new standard is based on the principles of the INTOSAI performance audit manual, with several important distinctions. The ECA standard differentiates specifically between performance and financial/compliance auditing, emphasizing that the discipline of performance audit is not rooted in accounting but in the social sciences and evaluation; the focus is not on finance but on the organization, and the methodology is flexible, not standardized (CEAD AMS Unit, 2013). A performance audit that includes elements of both financial audit and compliance is defined by the ECA as a “comprehensive audit”. Chapter 2 of the ECA standard addresses approaches to evaluating economy, efficiency and effectiveness, noting they may be measured directly (using inputs, outputs, results, and impacts) or indirectly (assessing policies and procedures). The standard also emphasizes identification of risk when developing audit questions (CEAD AMS Unit, 2013). The ECA standard is an important step forward in the development of a meaningful and flexible performance audit methodology that truly satisfies the implied performance audit mandate, e.g. an objective assessment of performance conducted for assurance purposes.

If the aim of project performance audits is to improve the outcome of projects, the standards used need to be expanded to incorporate more comprehensive assessment of project management elements. The ECA standard is a step in the right direction. The next section of the paper explores a number of project assurance methodologies which are utilized as performance audit proxies. Existing performance audit guidelines may need to be revised, or new project performance audit standards developed, to adopt the positive aspects of these assessment practices.

3. Project Assurance Methodologies

The field of project management is an important part of the management sciences. One concept that is almost universally accepted as fundamental to all projects is known as the project constraint “iron triangle” of time, cost and quality. But, how does a performance auditor evaluate objectively whether the time, cost and quality aspects of the project are on track?

The next section of the paper explores different approaches to providing assurance (confidence) to stakeholders regarding the effective management and true status of projects. Each of these methodologies is used to assess and report to stakeholders on specific elements of project management and construction management. The most common project management assurance mechanisms, used to report to stakeholders on project progress and risk, are 1) Value for Money (VfM) evaluations, 2) Stage gate (Gateway) reviews, 3) Project health checks, and 4) KPI and CSF metrics. Each concept takes a slightly different perspective on the management process used to provide assurance in project outcome. However, the fundamental premise of each approach is to guide project participants down a path that delivers the best project outcomes, given the specific circumstance in which they are developed, and to report truthfully on that progress.

3.1. Value for Money

Value-for-money (VfM) evaluations can be considered a proxy for government performance auditing (Glynn & Murphy, 1996). The objective is to provide periodic assurance to stakeholders that resources (inputs) are being expended in the right way but also in the least wasteful way with the highest lifecycle return on investment (Glynn & Murphy, 1996). The process is not widely used on capital projects in the United States; countries that have developed formal VfM methodologies include Australia, Canada, and the United Kingdom (Bidne, Kirby, Luvela, Shattuck, Standley, & Welker, 2012).

There are three assessment stages of the process: program, project, and procurement (Ismail, Takim, & Nawawi, 2011). The VfM process includes identifying program objectives and outputs, anticipated impact, their strategic relationship to the organizational entity, and then evaluating the validity, and economy, efficiency & effectiveness with which resources (inputs) are utilized and the objectives met. “Value for money in construction is about more than delivering a project to time and cost” (National Audit Office, 2004). Financial assessment is a significant element in VfM (Ismail, Takim, & Nawawi, 2011). In additional to review of financial aspects, VfM also considers
non-financial aspects such as “risk management; project level objectives; innovation solution; flexibility of operation; anticipated of users benefits; incentives and monitoring; facilities management services; public interest consideration, life cycle cost, market interest and sustainability requirements” (Ismail, Takim, & Nawawi, 2011), and softer elements such as project contribution to the greater social good. A very comprehensive VfM process may incorporate sub-audits and metrics, such as key performance indicators (KPI), and post-occupancy analysis (Ismail, Takim, & Nawawi, 2011). VfM may be applied during any project phase (Bidne, Kirby, Lulela, Shattuck, Standley, & Welker, 2012).

However, as with performance audit, there is no global standardized methodology for VfM evaluation. Policy has been developed on a country-by-country and organization-by-organization basis (Muniain, 2005). A hallmark of VfM is an exhaustive and prescriptive set of questions, which comprise a customized analytical framework. The VfM process is perceived to be very comprehensive, but cumbersome. A study of 150 government VfM evaluations was conducted in Sweden, determining the following (Gronlund, Svardsten, & Ohman, 2011):

- 67% of the VfM evaluations reviewed compliance with legislation, rules, or policies
- 40% of the VfM evaluations reviewed management and administration against industry best practices
- 12% of the VfM evaluations explicitly evaluated economy, efficiency, or effectiveness
- There was no indication that any of the VfM evaluations used a risk assessment as a basis for elements to be audited

The results of the VfM study are not dissimilar from the performance audit study. Again, it is clear that compliance is ingrained in audit culture, and that checklists of “best practices” are the norm for project assessment, while (in the examples reviewed) risk is curiously overlooked or perhaps not measured in the study.

3.2. Stage Gate Review

Stage gate (also known as gateway or phase gate) reviews are an evaluation methodology designed to provide technical and commercial assurance (Webb, 2003) at each phase of a project, focusing on risks and opportunities faced during that phase. As with VfM, the review may include business case, strategic priorities, management, controls, objectives realization, and more. Risk and stakeholder engagement are often included in the review. One key difference between VfM analysis and stage gate review is that the gateway review process is conducted at key milestones during the project lifecycle, resulting in a go / no-go decision at each milestone (Office of Government Commerce, 2007).

The typical framework includes considerable analysis at the front end of a project, including project definition, business case analysis, project approval, and project development / design. This makes the process useful in product development, research & development (R&D), and information technology (IT) projects. However, there is only one phase for implementation, which in capital projects is the high-risk construction phase. For capital projects, the implementation phase must be further defined to include all the sub-phases in construction and startup.

Countries that have developed formal stage gate review methodologies include the United States, Australia, New Zealand, and the United Kingdom.

3.3. Project Health Check

Project health checks are yet another evaluation methodology. Their objective is, as with the other methodologies, to assess performance, and recommend steps to be taken for improvement (Mian, Sherman, Humphreys, & Sidwell, 2004). The assessment is intended to reach beyond the time-cost-quality triangle of project tradeoffs.
As with VfM and stage gate reviews, there exists no standardized process for project health checks. Whereas VfM and stage gate review methodologies have typically been developed by government agencies, templates for project health checks have typically been developed by consulting firms. The project health check approach may include qualitative or quantitative evaluation of the business case, planning, organization, procurement method, governance, cost and schedule performance, quality, communication, and risk. Or, instead, they may rely solely on KPI and CSF. Project health checks tend to focus heavily on project management issues, and less on financial analysis.

Of the methodologies mentioned above, the project health check concept is the least defined and least structured, and thus most closely approximates the variability currently evident in the universe of performance audits.

3.4. Critical Success Factors

The use of critical success factors has been widely adopted as another approach by which to evaluate the health of projects. CSFs have not been specifically defined by industry, and instead represent criteria that have been identified through research (Mian, et al 2004; Poon, et al 2001).

Although there has been much research identifying success factors on construction projects, most focus on specific project aspects or critical criteria, including time and cost. Thus, they reflect the uniqueness of each project, not the industry as a whole. Other research has focused on productivity, contract disputes and procurement strategy. Past work by Poon et al (2001) identifies success factors specifically for the construction process.

The authors above often used stakeholder surveys to determine essential preconditions necessary to assure positive outcomes (success) for specific projects. As such, each author described the success factors differently, but analysis of the research suggests that many of the factors are very similar. An examination of the above research (Table 1) reveals that there are eight factors that appear to be common across projects.

4. Elements of Assurance

The fundamental characteristic of any project is that it will differ, in some fashion, from all other projects. So, the role of the auditor is to ensure that both the unique and generic aspects of the project are taken into consideration during a performance audit. While this project management notion suggests that the success of any project is inextricably linked with the circumstances surrounding it, this notion appears to be completely overlooked in audit literature. As a result, until a comprehensive and appropriate standard are developed, the realm of performance auditing will likely remain trapped in a mire of ineffective guidelines.

4.1. Comparison of Methodologies

In order to develop a basic performance audit methodology, the three methodologies above can be used to identify the most commonly evaluated elements of assurance.

The recurring theme, in all the approaches to assurance described above, is the definition of success and development of a framework by which to evaluate progress towards success. Ultimately, each of the approaches discussed above is serviceable for the same purpose, under the right circumstances. It is difficult to design a flexible, forward-looking method that is suitable for both public & private projects, encompasses all industries, and considers the assurance requirements of both internal & external stakeholders. And yet, assurance demands a robust methodology that is yet sufficiently flexible and succinct, a generic template that is relevant to the needs of specific projects (Hall & Holt, 2003).

The GAGAS and INTOSAI audit standards, which govern performance audits, are not effective in improving project outcomes. The result (Table 1) identifies many aspects of projects, which are not currently addressed by performance audit standards.
By tabulating the results from published examples of the three methodologies above, the following commonalities appear

Table 1. Comparison of assurance principles

<table>
<thead>
<tr>
<th>Assurance Principles</th>
<th>Stage Gate / Gateway Review</th>
<th>Value for Money</th>
<th>Project Health Check</th>
<th>Critical Success Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business case</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Benefits and impact analysis</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Governance &amp; controls</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Value engineering</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Design</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Environmental standard</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Statutory and regulatory requirements</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Lifecycle costs</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Procurement and contracting</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Safety</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Risk planning</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Documentation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Progress reporting</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Change management</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cost (on budget)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Schedule (on time)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Meets specifications</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Attained quality of workmanship</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Litigation</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Lessons learned</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Stakeholder expectations</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

The next section of this paper discusses the impact of three key aspects that are universally found in the project assurance approaches.

4.2. Top Success Factors

Referring to Table 1 above, only three elements (cost, schedule, and procurement / contracting) appear in the scope of all four of the assurance mechanisms reviewed, as key drivers of project success. At a minimum, these elements should be assessed in any capital project performance audit, and the other elements identified in Table 1 can be added to the assessment as is appropriate for that project. These three elements could be called the ‘triad of project success’.

4.2.1. Cost
Cost is one of the ‘iron triangle’ elements mentioned earlier. Project costs “include any investment of resources in the enterprise's assets including time, monetary, human, and physical resources” (Technical Board, 2006).

Elements of cost appear in projects during the earliest phases of business planning, through project design, economic and financial analysis, planning and scheduling, change management, and risk management. Cost is a key element in value analysis. Cost must be reported, managed, and forecasted throughout the project lifecycle, from ideation through planning, execution, closure, asset management, and operations. As, ultimately, every resource utilized can be quantified as a cost element, it is no surprise that cost is one of the elements most frequently identified as a critical success factor, key performance indicator, and metric.

4.2.2. Schedule

Schedule is another of the ‘iron triangle’ elements mentioned earlier. Scheduling is “a predictive process of estimating and assigning the duration of activities based on available resources and planned means and methods and iteratively refining the planned activity logic in a way that achieves asset investment and project time objectives. A schedule is the output of the planning and scheduling process that documents planned activities and their start and finish times in a way that is logically sequenced; achieves asset investment, operation, project or other time objectives; and addresses available resources, investment objectives, and constraints” (Technical Board, 2006).

Elements of schedule appear in projects during the phases of business planning, project design, economic and financial analysis, planning and scheduling, change management, and risk management. Schedule must be reported, managed, and forecasted throughout the project lifecycle, from project justification through implementation and startup. As time itself can also be quantified as a cost element, and time to market is often a determinant of profitability, schedule is almost always paired with cost as one of the elements most frequently identified as a critical success factor, key performance indicator, and metric. Indeed, cost and schedule are combined in cash flow analysis and the progress measurement process known as earned value management.

4.2.3. Procurement and Contracting

Selecting a procurement method and administering contracts affects project delivery, risk allocation, change, schedule, and cost. Procurement in construction has been defined as “the organisational structure adopted by the client for the management of the design and construction of a building project (Masterman, 2002). The essential role of the procurement process is to allocate the risks and responsibilities to the parties that in the best position to manage them. The choice of procurement systems is therefore fundamentally important to the success of projects.

The procurement process selected for any project will be greatly affected by the circumstances under which they are delivered. So, for any particular project the choice of procurement system will have major impact on its success. Once again, the position of the auditor is not clear; in fact performance audit guidelines give no guidance into how this issue should be addressed.

Procurement and project delivery methods include: contractual terms, progress reporting (often cost and schedule), change management, dispute resolution and many other responsibilities between the parties involved. All of the project management principles addressed in this paper highlight the importance of the procurement process and contract. Yet, in spite of its significance, its impact has thus far rarely been central to the scope of typical performance audits.

4.2.4. Other Issues

Some additional universal observations can be made, regarding the performance audit process. These need to be considered when developing a methodology.
A challenging truth of performance review is that evaluations of economy, efficiency and effectiveness are, by their very nature, subjective and thus difficult to perform (Glynn J. J., 1996). As such, even though they are integral to the definition of performance audit, they tend to be ignored during the review process, or the assumption made that review of “best practices” and controls somehow ensures the three E’s. They are rarely measured directly. Until a definition can be universally agreed for the three E’s, they might never be measured directly. Indeed, the concepts of the three E’s may well be a utopian ideal that will never be defined nor objectively measured. However, they can be assessed indirectly, in terms of definitions of success and expectations of assurance.

One additional flaw is that many of the existing assessment models emphasize the use of lagging measures instead of leading measures (Gyadu-Asiedu, 2009). “Common practice in organizational research involves collecting performance data at a single point in time. While this approach is often a practical necessity, it treats performance as if it were a discrete event” (Steel & Van Scotter, 2003). Due to the ever-changing nature of risk, trending and anticipation are integral to any comprehensive assessment of projects.

In each of the methodologies described above, there appears to be no escaping the use of checklists for project assessment. The concern is that the list of “best practices” might be meaningless, yet the quality of project management and controls is measured against them (Shand & Anand, 1996). Projects can still fail despite the utilization of “best practices”, because decision-making can be flawed even where policies & procedures have been followed and the required paper trail generated. Project performance is “a payoff function that depends on the state of the world and the choice of a sequence of actions” (Pich, Loch, & de Meyer, 2002). Too often, choices made, their effects (causality), and the state of the world are not represented in compliance review; too little is known about the decision-making process and circumstances.

5. Conclusion

This research examined the extent to which performance audit can result in an informed true and fair report of the status of the capital project under consideration. Past research has identified that in reality a construction performance audit is closer to the practice of evaluation than to financial audit. The standards and guidelines that currently exist are not only extremely broad and open to interpretation, but more importantly, are focused more on audit engagement outcomes than performance outcomes. The scopes of work most often are focused on compliance. This calls into question the effectiveness of performance audits as a mechanism to address project success.

The use of the term “Performance” seems to be loosely defined, and the GAGAS and INTOSAI guides seem to allow a range of practices to exist along one another, which results in the provision of consulting services that often result in meaningless outcomes rather than consistency. The contribution of this research has been to challenge the relevance of the established GAGAS standard as an effective mechanism to deliver Performance Audits. The conclusion reached in this paper suggests that unless the principles of best practice project management and methodologies of capital project assessment are considered, performance audits will remain a contentious and misguided attempt at identifying and solving project shortcomings.

This research also identified a ‘triad of project success’, which is comprised of cost, schedule, and procurement / contracting as the key drivers of successful projects. These three project elements should always be assessed during performance audits, as they have the greatest potential impact.
Reference


