Governance of Mega and Giga Programs[1]

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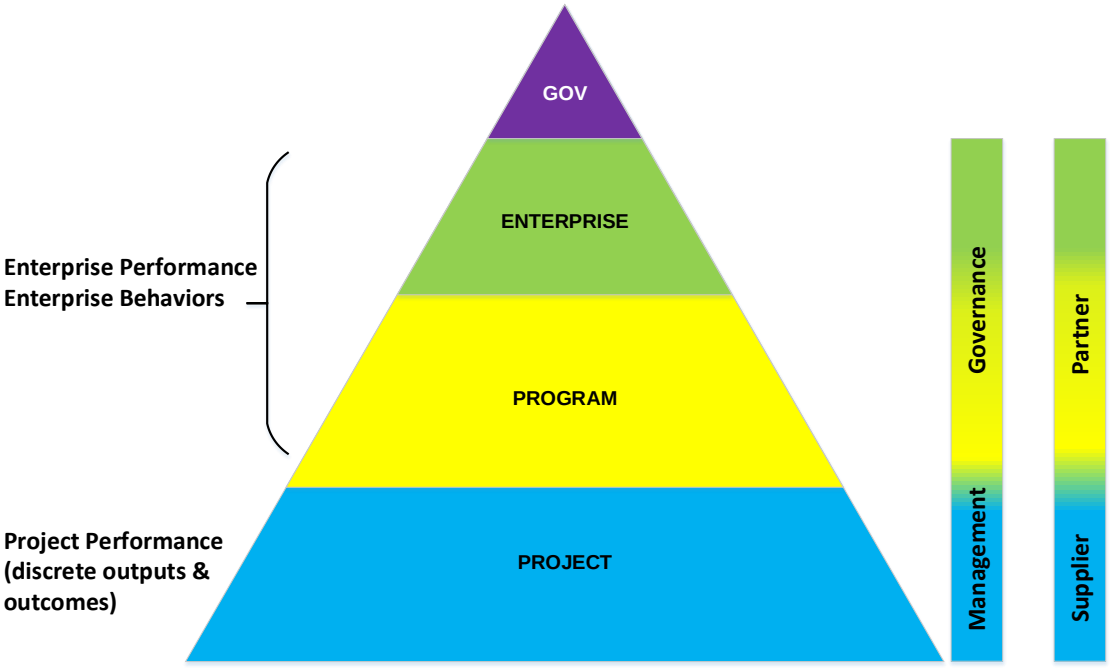
In the engineering and construction industry governance needs and requirements exist at multiple levels. These include:

- Governmental and industry level governance (laws, regulations, codes, standards)
- Enterprise level (encompassing social (stakeholder), political, economic (market, shareholder, financial institutions), cultural (corporate and national/local), technological)
- Portfolio and programs
- Project

This paper focuses on the portfolio and program level, collectively referred to as program in this paper.



Enterprise level portfolio and program management in the engineering and construction industry represents a fundamental re-allocation of responsibilities and authorities between

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the traditional owner organization and an engaged program manager. The program management function can be viewed as consisting of two discrete elements:

- An enterprise level program management oversight function[2]
- A program management office/contractor

The readiness of the owner organization to adopt such a delivery strategy and execution approach is governed by many factors including:

- overall capital project delivery volumes
- prior experience, if any, with portfolio and program management delivery approaches
- inherent organizational capabilities and depth of staff
- degree of recognition of the level of self-change that adoption of a different delivery and management methodology requires

From the program manager's perspective, a key factor for success will be the degree to which its responsibilities can be clearly defined and responsibility and authority allocated consistent with these responsibilities and the owner organization's own readiness. Well developed contractual and implementation frameworks are therefore key ingredients for success but in many cases, even the best developed frameworks are undermined by a poorly defined governance regime and inadequate contract administration capabilities within owner organizations. This later factor sometimes reflects passive resistance to change while in other instances it reflects inadequate organizational maturity to adopt the new delivery regime.

This paper is not intended to dwell on the failings of either the program management or broader owner organizations but rather outline some of the governance features which are hallmarks of successful portfolio and program management implementations.

Governance Thinking

Governance thinking associated with the delivery of large complex capital project portfolios and programs has developed across a wide range of industries ranging from government implemented healthcare transformations to enterprise wide IT delivery efforts. In the engineering & construction industry, attention to governance issues at the outset of program initiation has been to a large degree spotty and inconsistent. The evolving nature of programs delivered in the engineering & construction industry and, more importantly, the inherent risks that program manager's increasingly face give rise to a necessary refocusing

[2] The program management office or PMO is not explicitly covered in this paper but among its responsibilities are management and oversight of the tollgate process and what I refer to as strategic audit. Appendix 1 contains a sample strategic audit checklist for a PMO in a mega transportation program.

on governance issues. The engineering & construction industry can, however, draw not only on its own experience but on that of other sectors as well.

Key Success Factors

A review of identifiable key success factors from a broad range of programs internationally suggest that certain characteristics are common to successful program management applications. These success factors include several with governance implications including:

- Strong and decisive leadership by senior management
  - Supported by clear and appropriate allocation of responsibility and authority without ambiguity

- Early, consistent and direct involvement of frontline staff
  - With appropriate feedback mechanisms to encourage, collect and analyze criticism without fear of retribution

- Engagement and ongoing involvement by each stakeholder population both within the owner's organization as well as externally
  - Communication chokepoints are avoided even while control points are strengthened

- Acceptance and projected confidence in the implementation of new strategies and solutions at early program stage
  - Leadership by example and strong "sponsorship" by the executive are essential to programmatic success
  - Areas of concern or uncertainty are monitored consciously but self doubt is reserved until supported by information based decision making

- Utilization of experienced, neutral, external facilitators to drive organizational change management and alignment processes; identify latent conflicts for resolution; and facilitate building of the required multidisciplinary team focused on undertaking the program management "journey"
  - Team building and alignment processes must be contractual requirements of both the owner and the program manager

- Clear recognition that many parts of the project delivery system need to be restructured simultaneously for effective program delivery
  - Governance structure must provide the program manager with the ability to act in parallel versus sequentially within an accelerated change time horizon

- Collective determination of key performance indicators and their application
    - Owner organization must transition to an outcomes based management style versus more traditional input control management styles

- Comprehensive data analysis by experienced staff with a programmatic and systemic focus; and, timely reporting of KPIs
    - Performance assessment regimes require owner oversight staff to adopt new perspectives that are broader than project based performance assessment; new skill sets and training must be implemented at an early stage

- Recognition and reward for success emphasized over penalty for failure
    - Governance regimes must increasingly adopt a reinforcing versus punitive framework

- Appropriate resourcing of program management role with sufficient flexibility to migrate the organization structure and skills mix as the program evolves
    - Program management's need for a more robust structure and control is understood in light of the larger impact their failure can have

Governance Structures

In the course of implementing a capital project portfolio or program, there are fundamental practices and governance features which must be put in place. These include (but are not limited to):

- ***Strong Foundations*** *built on:*
    - Governance - the structure and process to control operations and change to performance objectives. Sufficient authority must be provided to the program manager to take timely actions for program success while at the same time assuring that owner driven changes to program objectives are strategic in nature and not merely expressions of sub-group preferences. This tradeoff of flexibility for improved outcomes typically represents a major change management challenge even in the contractual negotiation stage. Governance structures must be supported by a well defined framework for program sponsorship at both the program and executive levels in the owner and program management organizations. Governance structures must provide for clear leadership and establish the requisite ethical, safety and other cultural foundations that successful programs require.
        - Critical success factors for governance leadership:
            - shape strategic thinking
            - achieve results

- cultivate productive working relationships
- exemplify personal drive and integrity
- communicate with influence.

- Standards - activity and limits that define the performance "architecture" for the programs systems, structures, components and practices that will aid in the capture of the value inherent in a program management approach.
- Integration - activity to optimize performance across the program value chain functionally and technically. Program management may result in a reconfigured or perhaps even new value chain. Traditional owner – supplier relationships may need to be modified to provide the program manager with the authority and freedom of action required to fully integrate all elements for success. Certain owner functions may need to take on a shared management approach (risk and contingency management are examples).
  - Key components of effective risk management include:
    - robust systems in place
    - detailed consideration of the risks facing the organisation as a whole as well as major policy or strategy developments and/or operational tasks or projects
    - establishment by management of appropriate processes and practices to manage all risks
    - analysis and review of risk management approaches
    - active involvement in risk management of everyone in the organizzation

To be effective, the risk management process needs to be rigorous, structured and systematic. Emphasis is on real actions and outcomes so that it does not become essentially a process-based exercise. Effective risk management requires an organisation to have a risk-assessment culture whereby all major decisions are considered in terms of risk management principles

- ***Windows into the Program Management Effort,*** to provide:
  - Assurance - activities to verify and validate all operations delegated to the program manager as well as his readiness and capacity to perform. Objective assessment standards must be clearly agreed to at the outset of the project. Key elements of internal conformance and accountability include:
    - documentation of the objectives, roles and powers of the owner's representative, program director and executive or steering committee
    - internal audit and review processes and functions

- documentation of objectives, roles and powers of other program committees (for example, HSE)
- owner and program manager business planning arrangements that aim to make conformance and accountability integral to the way the organisation meets its business and project execution objectives
- performance planning and monitoring arrangements
- fraud control plans and processes, including any planned inspector general type structures and how they are integrated into project execution processes
- up to date and consistent rules relating to financial and other delegations
- clear and widely communicated policies on the standards of professional and ethical behavior

An organization with effective internal conformance and accountability will have staff and management who know, understand and communicate clearly their own roles, powers and responsibilities and how these relate to others in the organisation.

- Alignment - activity to support higher level vision, goals and objectives. Alignment sessions are ofter uncomfortable to participants since by nature they are designed to resolve policies, conflicts and drive accelerated decision making and action. Alignment is further reinforced by governance systems and processes such as:
  - Effective corporate, business and program execution planning. It is important to ensure such plans down to, and including, individuals' performance plans, are aligned and mutually reinforcing. This reduces the potential for unclear or conflicting objectives or gaps in execution planning.
  - Clear and robust budgeting and financial planning systems, overseen by an appropriately resourced finance committee or equivalent.
  - Various reporting and measurement frameworks for financial and non-financial aspects of the organisation's specified outcomes and outputs.
  - A structured and regular system of performance measurement and monitoring aligned with the organisation's outcomes and outputs structure.
  - Consideration of program wide and cross-project issues in policy development and program execution. Issues related to joint or shared accountability, risks and responsibilities can affect governance arrangements.

- Improvement - activity to continuously assess performance, research and develop new capabilities and systemically apply learning and knowledge to the program. Performance criteria must provide the program manager with the necessary authority to innovate and drive new systemic continuous improvements into the project execution process.
- Business Process Improvement – activity undertaken by the program manager that not only identifies business process improvement actions within the program management function but also in the activities undertaken by and between those suppliers and service providers managed by the program manager. Business process improvement should also identify process changes in the owner organization that would further reinforce the efforts of the program manager in the achievement of program success. The executive sponsorship requirements outlined under "governance" are essential to success of these efforts.

- ***Supporting Structures for Program Success***, including:
  - Organization & Change - activity to manage competencies, learning, knowledge and communications are increasingly important given the lifetime of program organizations. Owner and program management organizations must be on the same page when it comes to the capture and utilization of knowledge and lessons learned and governance frameworks sufficiently defined to promote capture of lessons learned for improvement rather than as a tool for assignment of punishment. Communication takes on increased importance in a program management delivery strategy but must be matched by having singular points of control for changes. Owner organizational elements which previously had directive authority with respect to certain project types now part of the integrated program management approach, must adjust to an oversight versus directive role with respect to these activities embedded in the new program management organization. Change request must now come through a strengthened change management process to ensure programmatic benefits driven by standardization, common supply and carefully sequenced project execution are not unduly impacted.
  - Oversight - activity to structure reviews, accountability and management of projects, stakeholders or suppliers. The segregation of responsibilities between owner and program management organizations need to be clearly defined and demarked with a bright line. This is not inconsistent with integrated or salt and pepper approaches to various organizational elements. Rather in these integrated structures, clear processes for action and decision making are all the more important. The PMO plays a key role in oversight and audit of the independent program management organization. A sample audit focus table is provided in Appendix 1.

Governance governs

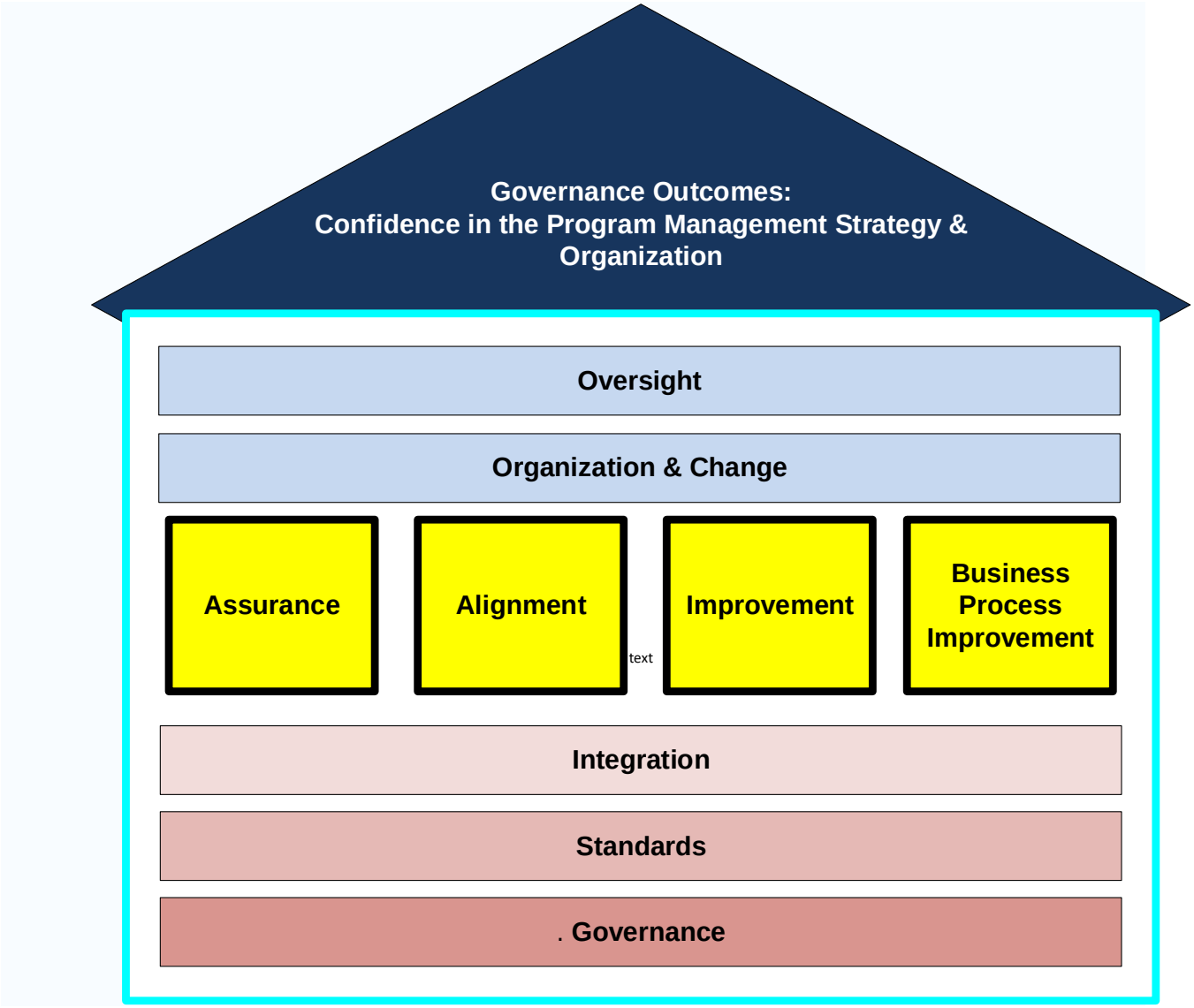
On "giga" project after "giga" project, governance is a key issue. The roles of the program manager and owner change when compared to projects of a smaller scale. Simply put, the highest levels of the owner's organization are more engaged but with a focus built almost exclusively around achievement of a small set of well-defined strategic business objectives and assessing the effectiveness of the primary strategies being employed to achieve those objectives. Similarly, the program management organization requires broader performance metrics, aligned with achievement of these strategic business objectives, and higher degrees of delegation than what would typically be practice on a mega program.

One question which arises in many of these "giga" programs is whether an integrated program management team is possible, staffed by both owner and third party program management personnel. While the answer is yes, on one particular program this integrated management structure blurred accountability and responsibilities, and discouraged proactive management.

This integrated management structure was implemented without the governance protections required for it to be workable.

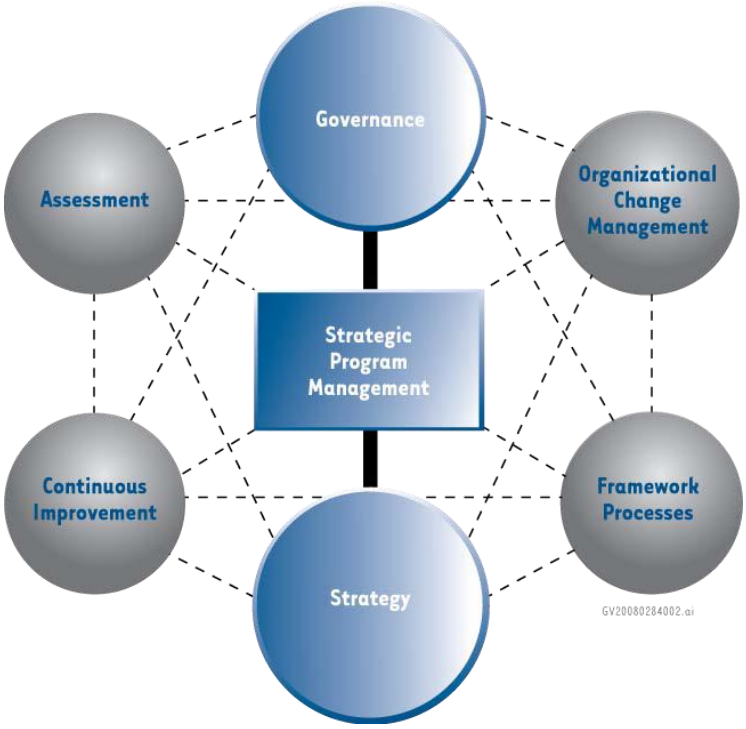
- **Governance Outcomes**

When comprehensively implemented, the program management governance structure described above provides the framework for the desired governance outcome in program management delivery of large engineering & construction programs, namely, the requisite confidence in the program management strategy and organization which is the sine quo non of successful program execution.



Governance Does Not Stand Alone

Governance is one element of a broader, more strategic program management system that is essential for effective delivery of mega and giga programs. This is shown in the following figure with the all-important strategy – governance axis highlighted.



The strategy-governance axis plays a central role in effective delivery of outcomes defining programs. While strategy is clearly enhanced or constrained by different resource and stakeholder environments, it would be all too simple to change strategy every time there was the slightest change in these external factors. A hall mark of many failed programs is just such a strategy "du jour" approach.

While clearly certain changes in resource or stakeholder factors can influence strategy, it is important to avoid unnecessary strategy rotation at even the slightest changes. The key to this is to develop sufficiently robust strategies in the first place that appropriately consider the variability and uncertainties in the resource and stakeholder environments.

The tool to provide requisite strategy discipline is the governance framework established at the outset of the program. Clearly a balance must be struck between true strategy change and anticipated evolution of strategy as certain aspects of the external environment and their impact on strategy become known.

Let's let's look at an example, an owner with 50 million tons of valuable mineral resource who is looking to sell 100 million tons. Clearly if the strategy to acquire the added 50 million tons had been to acquire a specific property representing another 50 million tons, then unavailability of that property would necessitate a strategy change. If however the initial strategy had been to acquire through a combination of competitor and property acquisition an added 50 million tons, then unavailability of one particular property would not necessarily invalidate the strategy.

Conversely, if the strategic business outcome desired necessitated a change to the target sale from 100 million tons to 200 million tons, the impacts on strategy would need to be assessed and potentially a new strategy put in place. This kind of fundamental change can be extremely disruptive to achieving any given set of strategic business objectives and therefore two conditions must apply:

- Strategic business objectives must be truly strategic, easily measured and void of delivery of processes, preferences or biases.

- Strategic business objectives must only change through a well-defined and controlled process with executive level involvement by both the owner and program management organizations.

The importance of this last point cannot be understated since the program manager has a need to clearly communicate to the owner the ramification of such a fundamental change as well as identify the strategic change required and the new strategy that must be put in place to meet these new business objectives. As said well by others, “hope is not a strategy”.

Governance frameworks and processes and strategy must be mutually reinforcing.

Governance Best Practices

A best practices framework showing the allocation of responsibility between the owner and program manager organizations is illustrated in Table 1 below. Actual allocation of responsibilities and authorities may vary based on owner risks, maturity of the owner’s and program manager’s organization, and statutory or regulatory considerations.

This framework represents a good point of departure as governance responsibilities are allocated between various program participants.

Summary

Governance of mega and giga programs is an essential element and prerequisite for success. It is a key feature in distinguishing these large complex projects from more traditionally delivered projects.

Best Practices Framework
Top Level Governance Related Responsibility and Authority

Table 1

	Owner's Responsibility	Program Manager's Responsibility	Owner's Authority	Program Manager's Authority
Strategic Business Objectives (SBOs)	Establish*	Establish Top Level KPIs To Achieve SBOs	Approve Top Level KPIs	Recommend Changes to KPIs to Reflect Program Evolution
PMC Contract	Select/Approve/Review	Execute Delegated Actions; Advise and Implement Non Delegated Actions	All Non Delegated Actions	All Delegated Actions
Prime System Contracts (Metro and Tram Design; Principle Construction; Business Development)	Select/Approve PMC Requested Changes Above Delegated Authority	Manage; Establish KPIs; Approve Changes Within Delegated Authority; Request Changes Above Delegated Authority	All Non Delegated Actions	All Delegated Actions
Stakeholder Agreements	Execute	Recommend; Negotiate (as authorized)	All Actions	As Specifically Delegated
Stakeholder Communication	Approve Program and Top Level Messages	Execute Program	Oversight	All Communications Unless Reserved
PMC Subcontracts	Oversight	Select/Approve/Review	Oversight	All Consistent With Agreed to Process and Procedures
Contracts Other Than Prime Contracts Above	Approve Scope and Budget (including risk and contingency)	Select/Approve/Review Within Approved Budgets; Establish KPIs	All Non Delegated Actions	All Delegated Actions

Table 1

	Owner's Responsibility	Program Manager's Responsibility	Owner's Authority	Program Manager's Authority
Master Schedule including Owner Actions	Approve; Oversight	Prepare; Execute Delegated Actions; Advise and Implement Non Delegated Actions	Overall Authority; All Non Delegated Actions	All Delegated Actions
Programmatic Budget	Approve; Oversight	Prepare; Execute Delegated Actions; Advise and Implement Non Delegated Actions	Overall Authority; All Non Delegated Actions	All Delegated Actions
Funding Plan	Prepare/Approve	Input; Required Analysis	Overall Authority	Support
Risk Register and Reserve	Shared Ownership	Shared Ownership	Tiered Authority	Tiered Authority
CEO Forum	Chair	Define Membership; Develop Agenda; Convene	All Non Delegated Actions	All Delegated Actions
Strategy Advisory Group	Chair	Define Membership; Develop Agenda; Convene	Oversight	Recommend Strategy to Owner/PMC
Knowledge on Line	Approve Program Scope; Oversight	Implement	Ownership of Program Specific System	All Delegated Actions
Technology Transfer and Organization Building	Approve Program Scope; Oversight	Implement	Ownership of Program Specific System	All Delegated Actions
Audit (Strategic, Management, and Financial)	Overall	Execute Delegated Actions; Advise and Implement Non Delegated Actions	PMC Contract; Prime Systems Contracts	All Other Contracts As Delegated

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
Program Plan	Does formal program plan exist?	Is program plan being utilized and maintained up to date?
	Are DoT and Program Management Consultant efforts aligned with this plan?	Are projects and program management organizational elements aligned with the program plan?
	Is Program Management Consultant utilizing and maintaining an up to date Program Plan in the management of his activities?	Are projects and program management organizational elements utilizing and maintaining an up to date plan?
Stakeholder Management	Have all stakeholders at the Program level been identified?	Does a stakeholder management plan exist; are responsibilities apportioned between DoT, Program Management Consultant and respective projects; and being utilized and maintained up to date?
	Does a stakeholder management plan exist, responsibilities apportioned between DoT and Program Management Consultant and utilized and maintained up to date?	Do the individual projects have stakeholder management and third party interface plans in place, are they being utilized and maintained up to date?
Communications Plan	Does external communications plan exist and is it being implemented?	Is a comprehensive internal communication plan in place and is it being adequately implemented across all projects?
	Has Program Management Consultant developed and implemented a robust	Have individual projects put in place required project level communication plans

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Strategic Audit Focus

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	internal communications plan?	and taken steps to implement any communication requirements assigned to them by the internal program Communication Plan?
Program Management	Have key strategic business objectives been clearly communicated in a consistent way to the DoT's and Program Management Consultant's team?	Have program goals and strategic business objectives been incorporated into each of the framework processes?
	Have the key elements of a coherent program management strategy been established? a. Program monitoring and measurement plan and methodology (key metrics) b. Program status reporting structure and process c. Change management plan d. Issues management process e. Risk management plan	Are framework processes providing the Program Manager with the necessary tools and information to manage and track overall program progress? Are cross cutting trends being adequately identified, analyzed and managed?

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
Program Management (cont.)	Has the Program Management Consultant implemented all required framework processes and are those processes producing the desired outcomes?	Are project level management systems in place and providing required programmatic data in a timely way? Are project level management systems being adequately used to accomplish project level activities?
Program Scheduling and Tracking	Are external factors sufficiently reflected in the overall program schedule?	Are external factors reflected in the overall program schedule being actively managed by the program management organization?
	Are identified risk factors being actively managed and tracked by the DoT's organization or Program Management Consultant as appropriate?	Are identified risk factors being actively managed and tracked by the program management organization or projects, as appropriate?
	Is Program Management Consultant adequately identifying systemic program issues affecting schedule and recommending corrective or risk limiting actions?	Are the organizational elements of the Program Manager adequately identifying, analyzing and recommending and implementing corrective action for systemic risks?
		Are projects adequately identifying issues affecting schedule and taking corrective actions?
		Are program and project level milestones being adequately tracked and managed?
		Have activity relationships and interdependencies within

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
		tasks and across projects been adequately identified?
		Are changes in deliverable commitments agreed to by all affected groups and individuals?
Program Status Reporting	Is program status reviewed with Program Management Consultant at appropriate intervals? a. Overall status b. Program performance (achievements and milestones) c. Open issues d. Risks e. Action items f. Cost and time performance against plan g. Quality metrics h. Involvement by ALL relevant DoT's organizational elements	Is project status reviewed with senior management of projects at appropriate intervals? a. Overall status b. Project performance (achievements and milestones) c. Open issues d. Risks e. Action items f. Cost and time performance against plan g. Quality metrics h. Change Impact Assessment i. Interface management j. Involvement by all relevant Program Manager organizational elements

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
Program Status Reporting (cont.)	Have adequate procedures been put in place for project coordination and status reporting across project boundaries by the Program Management Consultant?	
Program Budget and Forecast	Do program estimates reflect both risks associated with quantity uncertainties as well as possible risk events?	Are program activity budgets clearly assigned within the Program Management Consultant's organization?
	Are risk allocation and management responsibilities between the DoT and Program Management Consultant clearly defined?	Are risk pools comprehensively defined and actively managed? Are systemic cost drivers being adequately tracked?
	Is the Program Management Consultant adequately managing risk pools within his purview?	Are projects accurately measuring progress and adequately forecasting trends and opportunities for cost savings?
Risk Management	Is an up to date Program-wide risk assessment in place at the DoT's level?	Is the Program Management Consultant's risk assessment and management process being adequately implemented and is it providing timely actionable information for the Program Management Consultant and DoT?
	Is the Program Management Consultant's risk assessment and management process being adequately	Are significant changes in risk posture or the emergence of new risks being adequately identified across all projects and

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
	implemented and is it providing timely actionable information for the Program Management Consultant and DoT?	program management activities being actively managed and tracked?
	Are significant changes in risk posture or the emergence of new risks being adequately identified by the Program Management Consultant, managed and tracked?	Are significant changes in risk posture or the emergence of new risks being adequately identified by projects, managed and tracked?
Quality Management	Does the program have a “Quality Culture”?	Has the program quality culture been adequately flowed down to projects and key suppliers?
	Does the Program Management Consultant have a quality plan covering all policies, guidelines and procedures?	Are quality related policies, guidelines and procedures clearly communicated, trained, implemented and assured?
Quality Assurance	Has an overall quality assurance plan been developed and implemented by the Program Management Consultant for the program in accordance with program needs and contract requirements?	Has the programmatic quality assurance program been translated into specific quality plans for all elements of the program management organization as well as for individual projects and key supply chain activities?

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
Quality Assurance (cont.)	Is the implemented quality assurance program supporting the meeting of the strategic business objectives defined?	Are quality programs implemented at the project level providing timely identification and mitigation of quality affecting issues?
		Are programmatic quality findings and lessons learned being effectively incorporated into new planned activities and transmitted across all projects in a timely manner?
Management Procedures	Does the Program Management Consultant have in place and is he implementing a comprehensive and integrated set of management procedures that provide assurance of achievement of the program's strategic business objectives?	Are all elements of the program management organization implementing established management procedures? Are these procedures providing adequate control of program activities and will they support the delivery of strategic business objectives?
	Are the implemented procedures being comprehensively applied across all framework processes?	Have projects and key suppliers put in place the necessary procedures to manage their work efforts and provide sufficient management information to the Program Management Consultant to facilitate overall program management? Are the procedures being effectively implemented and are they causing the required results?

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
	Are resources applied by the Program Management Consultant adequately forecast, controlled and tracked to assure program efficiency?	Are management resources applied at the project level adequate to manage the assigned tasks successfully?
	Have the personnel with the necessary skills and competence been identified and has agreement for their participation in the program been reached?	Have the projects been resourced with the requisite number of skilled personnel consistent with overall program and contract requirements?
	Does the detailed program work plan match the complexity of tasks with the capabilities of personnel?	Is the project work plan sufficiently detailed, resourced and measured to assure progress in accordance with project requirements is being achieved?
	Has appropriate allowance been made for the effect of the learning curve on all personnel joining the program who do not have the required prior project execution methodology (program management) industry, functional and technical expertise?	Has adequate allowance been made for mobilization, interfaces and demobilization?

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
Management Procedures (cont.)		Are project team members committed full-time?
Design and Analysis	Are requirements and design standards in place?	Have design standards been promulgated and design changes controlled to promote the maximum standardization possible on a programmatic basis?
	Are required design QA programs being implemented by the program manager?	Are specifications clearly traceable from physical design to logical requirements?
	Have programmatic efforts related to standardization, modularization and increased focus on constructability been sufficiently realized?	Do the design specification documents reference: a. Purpose/scope? b. Requirements specifications? c. Modularized or other standard components? d. Technical environment specification? e. Constraints and interfaces? f. Commissioning, start-up and testing requirements?
		Have design elements of the program utilized qualified designers and checkers?
		Are design QA and QC activities sufficiently documented?
Construction	Are intermediate construction milestones being met?	Have the interaction/interference between all projects been adequately reflected on the master program schedule?

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
	Is the quality of construction consistent with the program's strategic business objectives?	Has due consideration been given to supply chain delivery times and changing logistical requirements?
	Is construction productivity being enhanced throughout the program through use of standardization, simplification of details and application of programmatic type contracts?	Are construction activities for individual projects well planned, crews adequately prepared and equipped for the tasks to be undertaken each day and have site or task safety hazards been adequately communicated and necessary protective measures taken?
		Is construction productivity assessed at the project level and programmatically assessed across like activities?
		Are lessons learned within the program being transferred back across all projects and being incorporated into processes and practices?

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
Operations and Maintenance	Do adequate operations procedures exist?	Have commissioning and over activities been adequately planned, DoT's interfaces clearly defined and project level requirement fully addressed?
	Are Maintenance Metrics defined and in place?	Are responsibilities for warranty management pre- and post-commissioning well defined and adequately managed?
	Is there an improvement program in place?	
	Is there a warranty management program in-place for the post commissioning period?	
Financial Integrity	Are financial management controls in place to ensure the integrity of financial operations, disbursement of funds, payment to vendors, management of escrow and reserve accounts, maintenance of insurance, accounting for capital assets and in-process materials and other financial activities conducted by the DoT or the Program Management Consultant on behalf of the DoT?	Are financial systems and controls, including external audit functions, fully in place and adequately staffed with qualified staff?
	Have required financial audit activities been fully carried out?	Have audits of vendor, contractor and other supplier pay records and documentation been carried

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Strategic Audit Focus

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		out and to the extent required have similar sub-tier activities been audited for compliance with any such requirements?
		Have all audit findings been communicated as appropriate and subsequently satisfactorily closed out? Have all identified corrective actions been taken?
		Has all supporting documentation required by the DoT been completed and archived as appropriate?
		Are open claims and disputes tracked, resolved in a timely manner and closed out?
Contract Management Contract Management (cont.)	Has DoT's organization and Program Management Consultant efficiently designed all contract administration processes between them so as not to impact overall program performance?	Have each of the following contract management activities occurred for projects and suppliers agreements? Evaluate contractor performance or deliverables Verify and document evidence of actual or potential performance problems, constructive changes or other deviations Determine potential impact of technical issues on cost, schedule, and delivery and

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
		investigate/resolve rationale for potential or actual delays Specify technical criteria for the quality of the product, in-process test procedures and test points and acceptance criteria through engineering analysis Assess performance, quality and other technical issues and provide technical evaluation of the contracts for adjustment to, modification of, or compliance with the contract Analyze performance data for trends and issues. Resolve issues in data quality and performance quality Monitor the risk management process to identify technical risk, as well as cost, schedule and performance risk Review change proposals and alterations impacts on cost and schedule to ensure that adequate funding is available and that schedules imposed in the contract are not affected Review requests for waivers and deviations from

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
Contract Management (cont.)		contractor and field activities to determine the impact on system reliability and performance, as well as on cost and schedule Review change proposals for need, technical adequacy of design, consistency with program objectives, impact on operations, produce-ability, quality and similar programmatic concerns and make sure proposed changes are within the scope of the contract Conduct a cost-benefit analysis of the Value Engineering Change Proposal Participate in design review planning meetings in the event of potential impact to the contract (e.g., constructive change clauses, etc.) and conduct design reviews Support baseline reviews process Track corrective actions and interfaces with the contractor during project reviews until they are complete Ensure compliance with the configuration management requirements of the contract and consistency

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
Contract Management (cont.)		with the acquisition strategy, such as the decision to buy data rights or other strategies to ensure that a second source can build the hardware Assess the impact of stop work orders on contractor performance of the technical and programmatic requirements. Recommend stop work when contractor deficiencies are expected to result in delivery of nonconforming technical products. Evaluate contractor proposals to stop work for technical reasons Make sure engineering contractors are responsible for the professional quality, technical accuracy and coordination of all services required under their contracts and that firms are held liable for costs resulting from errors or deficiencies in designs furnished under its contract
		Have all necessary contract closeout activities occurred? These include: Settle all outstanding claims, issues or disputes; respond

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Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
		to contractor claims for additional money or contract adjustment; and determine if it constitutes a payable claim Verify that the contract is physically complete through physical and functional configuration audits Obtain all forms, reports and clearances required at closeout from both DoT and contractor activities and ensure they have met all applicable terms and conditions for closeout Make final payment Prepare contract completion documentation Assist DoT in identifying or settling unresolved issues, such as performance issues, unresolved Value Engineering Change Proposals, etc. Dispose of surplus property that the DoT does not wish to retain
	Has DoT's organization and Program Management Consultant efficiently designed all contract administration processes between them so as not to impact overall program performance?	Have each of the following contract management activities occurred for projects and suppliers agreements? Evaluate contractor performance or deliverables

Appendix 1

Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
Contract Management (cont.)		Verify and document evidence of actual or potential performance problems, constructive changes or other deviations Determine potential impact of technical issues on cost, schedule, and delivery and investigate/resolve rationale for potential or actual delays Specify technical criteria for the quality of the product, in-process test procedures and test points and acceptance criteria through engineering analysis Assess performance, quality and other technical issues and provide technical evaluation of the contracts for adjustment to, modification of or compliance with the contract Analyze performance data for trends and issues. Resolve issues in data quality and performance quality Monitor the risk management process to identify technical risk, as well as cost, schedule and performance risk

Appendix 1

Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
		Review change proposals and alterations impacts on cost and schedule to ensure that adequate funding is available and that schedules imposed in the contract are not affected Review requests for waivers and deviations from contractor and field activities to determine the impact on system reliability and performance, as well as on cost and schedule Review change proposals for need, technical adequacy of design, consistency with program objectives, impact on operations, produce-ability, quality and similar programmatic concerns and ensure that proposed changes are within the scope of the contract Conduct a cost-benefit analysis of the Value Engineering Change Proposal Participate in design review planning meetings in the event of potential impact to the contract (e.g., constructive change clauses, etc.) and conduct design reviews

Appendix 1

Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
		Support baseline reviews process Track corrective actions and interfaces with the contractor during project reviews until they are complete Ensure compliance with the configuration management requirements of the contract and consistency with the acquisition strategy, such as the decision to buy data rights or other strategies to ensure that a second source can build the hardware Assess the impact of stop work orders on contractor performance of the technical and programmatic requirements. Recommend stop work when contractor deficiencies are expected to result in delivery of nonconforming technical products. Evaluate contractor proposals to stop work for technical reasons Make sure engineering contractors are responsible for the professional quality, technical accuracy and coordination of all services

Appendix 1

Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
		required under their contracts and that firms are held liable for costs resulting from errors or deficiencies in designs furnished under its contract

Appendix 1

Strategic Audit Focus

Audit Element	PMO Focus	Program Management Consultant Focus
Contract Management (cont.)		Have all necessary contract closeout activities occurred? These include: Settle all outstanding claims, issues or disputes Respond to contractor claims for additional money or contract adjustment and determine if it constitutes a payable claim Verify that the contract is physically complete through physical and functional configuration audits Obtain all forms, reports and clearances required at closeout from both DoT and contractor activities and make sure they have met all applicable terms and conditions for closeout Make final payment Prepare contract completion documentation Assist DoT in identifying or settling unresolved issues, such as performance issues, unresolved Value Engineering Change Proposals, etc. Dispose of surplus property that the DoT does not wish to retain

About the Author

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Bob Prieto is a senior executive effective in shaping and executing business strategy and a recognized leader within the infrastructure, engineering and construction industries. Currently Bob heads his own management consulting practice, Strategic Program Management LLC. He previously served as a senior vice president of Fluor, one of the largest engineering and construction companies in the world. He focuses on the development and delivery of large, complex projects worldwide and consults with owners across all market sectors in the development of programmatic delivery strategies. He is author of nine books including "Strategic Program Management", "The Giga Factor: Program Management in the Engineering and Construction Industry", "Application of Life Cycle Analysis in the Capital Assets Industry", "Capital Efficiency: Pull All the Levers" and, most recently, "Theory of Management of Large Complex Projects" published by the Construction Management Association of America (CMAA) as well as over 700 other papers and presentations.

Bob is an Independent Member of the Shareholder Committee of Mott MacDonald. He is a member of the ASCE Industry Leaders Council, National Academy of Construction, a Fellow of the Construction Management Association of America and member of several university departmental and campus advisory boards. Bob served until 2006 as a U.S. presidential appointee to the Asia Pacific Economic Cooperation (APEC) Business Advisory Council (ABAC), working with U.S. and Asia-Pacific business leaders to shape the framework for trade and economic growth. He had previously served as both as Chairman of the Engineering and Construction Governors of the World Economic Forum and co-chair of the infrastructure task force formed after September 11th by the New York City Chamber of Commerce. Previously, he served as Chairman at Parsons Brinckerhoff (PB) and a non-executive director of Cardno (ASX)

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