

A rigorous governance framework guides capital project owners in effective decision making and lays the groundwork for project success.

Successful capital project delivery

The art and science of effective governance



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Introduction

Multiple trends have coalesced to make it more important than ever for companies that initiate capital projects to set up effective governance of those projects. Good governance generally has five defining characteristics:

- Clear project definition, including cost and schedule estimates and anticipated project scope
- A clear line of sight into project performance—particularly in terms of cost, schedule, and quality—at every stage in a project’s life cycle
- Internal accountability for achievement of project goals
- Effective contracting strategies
- Rigorous communication and reporting

Achieve good governance and transparency right from the start

Organizations that are initiating capital projects face multiple imperatives—whether they are taking on a single, reasonably sized project; a handful of small and medium-size projects; a portfolio of diverse projects; or one “megaproject” (i.e., a project that exceeds \$1 billion). To set the stage for success, companies need to build a viable business case for each project, secure financing in a tight credit market, and meet aggressive development schedules under rigid budget limitations and more. Also, the emergence of powerful megatrends is presenting both new opportunities (for capital infrastructure investment) and challenges (such as pressure on supplies of natural resources). These megatrends include exploding population growth, a shift in the global balance of economic power from developed

“Project owners who implement robust governance practices that meet the demands of the capital project delivery process are most likely to achieve their cost, schedule, and quality goals.”

—Daryl Walcroft, US Capital Projects & Infrastructure Leader

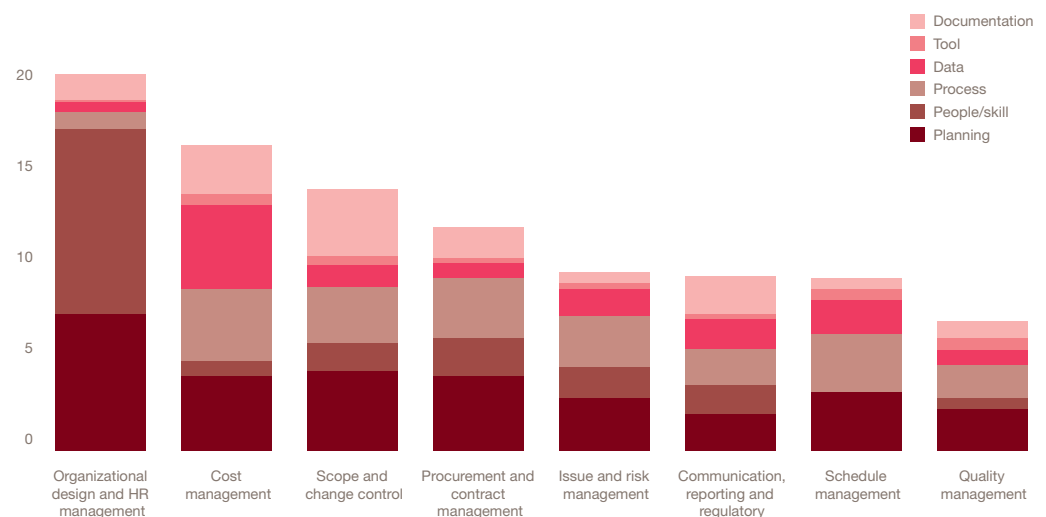
to developing countries, accelerating urbanization, climate change, and technological breakthroughs. Many of these megatrends affect decisions about what kinds of capital infrastructure projects a company will decide to invest in, as well as where to invest.

To manage the opportunities and meet the imperatives presented by emerging global megatrends, capital project owners can benefit by establishing a rigorous governance framework that guides effective decision making and lays the groundwork for project success.

Many organizations are skilled in enterprise risk management and other processes that focus on their core business. But the tools used to guide a bottom-line-focused enterprise may not easily transfer to managing deadline-driven, technically complex capital programs. In our experience advising on the planning and execution of capital projects across multiple industries, project owners who implement robust governance practices that are specifically designed to meet the demands of the capital project delivery process are the ones most likely to achieve their cost, schedule, and performance and quality goals.

PwC uses an integrated capital project governance framework to perform readiness assessments on the processes and controls required for effective capital project execution. In a recent sample of capital project readiness assessments, we analyzed 20 capital projects across a range of industries to identify more than 600 issues that companies encounter when they embark on a capital project. We also identified the recommendations provided to get the project back on track. Our analysis revealed that projects tend to display a lack of preparedness (or maturity) across eight project elements. Figure 1 shows the percentage of findings (and associated

Figure 1: A large proportion of our findings during capital project governance reviews revealed a lack of planning by the project execution team



Source: PwC analysis

“It doesn’t work when people are trying to do the work and figure out the schedule and fill in the resource gaps along the way.

Better to have your core team in place before moving forward.”

—Daryl Walcroft, US Capital Projects & Infrastructure Leader

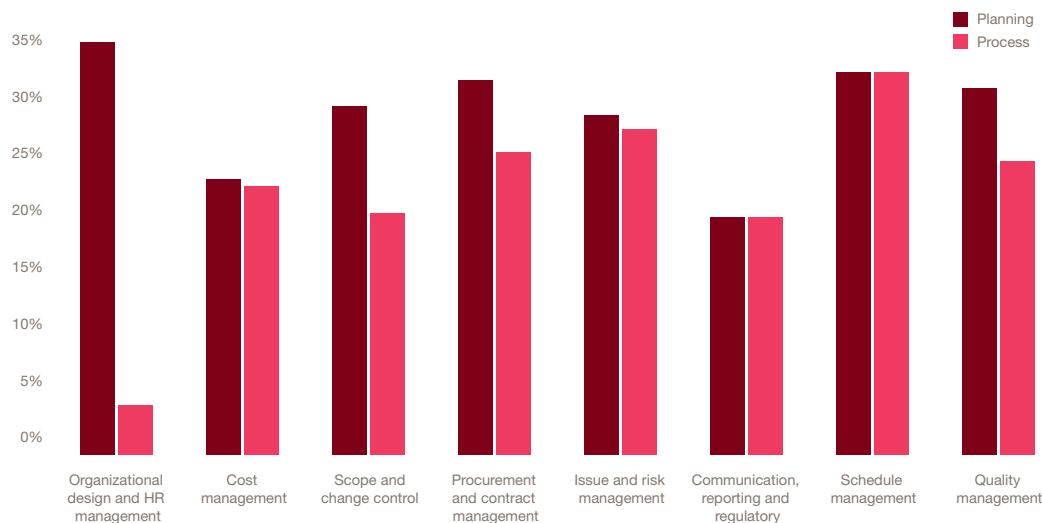
improvement recommendations) by project element. Within each element, the findings are further broken out by six “impact areas” critical to effective megaproject execution. Figure 2 also illustrates how good planning, compared to the execution process, impacts each project element and contributes to the overall success of a capital project. These results suggest that in all areas, lack of planning, preparation and experience can affect processes a project team uses to execute the project.

What is governance, exactly, in the context of a capital project? In its most fundamental form, capital project governance is the collective business

framework used to plan and deliver all commercial and technical aspects of a project. It involves:

- Creating an efficient project organization with clear lines of responsibility and defined roles
- Developing policies and procedures to guide consistent performance across the organization
- Implementing systems for collecting project execution data and reporting key performance indicators
- Deploying mechanisms that identify and mitigate performance risk.

Figure 2: Across the eight elements of our capital project governance reviews, 20–35% of our findings revealed a lack of planning and process maturity



Source: PwC analysis



Insights from experience



Daryl Walcroft
PwC US Capital Projects &
Infrastructure Leader

Observations about the importance of governance and transparency in managing successful capital projects

Q: *What new forces have made it more important for companies to establish a sound governance framework for their capital projects?*

A: A lot of projects that were previously put on hold are now being started up again. Companies are trying to deliver a portfolio of projects, not just one. In the face of increased demand and greater constraints on resources, companies are having difficulty finding enough talent to deliver these large programs. There's also more scrutiny into and more attention from the C-suite on capital efficiency—whether they're getting adequate returns on their capital investments.

Q: *Of the five keys to an effective governance framework, which do you see as most critical?*

A: Transparency comes to mind because it covers so much—people, processes, technology. For instance, to get accurate reporting that supports transparency, you need the right technology infrastructure and people who know how to use the technology as well as perform the processes required to gather and analyze data on projects at every stage in their lifecycle.

Q: *Would you say that transparency encompasses the other four keys to effective governance?*

A: Definitely. It's all about providing accurate and timely information on a project that supports effective decision making. So almost everything relates to that. For example, establishing the right contracts and managing them effectively is critical. But even if you've got the best contract in the world, it can't deliver unless you have transparency.

Q: *Why is it so hard for companies to establish transparency?*

A: For big companies that have three or four megaprojects in the works at the same time, going into each of those projects and getting a solid understanding of how they're doing is a huge undertaking. The company has to rely heavily on the many people who can directly see what's happening “on the ground” with a project, and it's not necessarily easy for them to tell the truth as they see it. When you layer that onto the data and reporting challenges, it gets even more difficult.

Q: *When you talk about transparency, do you mean with external stakeholders as well as internally within the organization?*

A: Absolutely. With a public company, external stakeholders need to know when issues arise on a project in order to know that they can trust the information they're getting.

Q: *Are some companies better at some of the five keys to effective governance than they are at others?*

A: In our work with very large, complex organizations, we've seen that there can be pockets of great governance in an organization and pockets of very poor governance. A company may have a partial governance framework in place, such as a strong internal project audit process that supports compliance, but may be weak in other areas. Finding an organization that does all of it well is rare.

Q: *What do you see companies doing to get better at capital project governance?*

A: Many are establishing centralized program management offices as well as standardizing their capital delivery processes, controls, training, and technology. Centralizing drives the standards, compliance controls, and so forth throughout the organization, and that helps create a culture of accountability.

Q: *Are these approaches right for all companies?*

A: No. The right kind of governance structure will depend on the nature of a company's business and its capital investment rhythm. For example, a company that's in a service business and that's planning to build a major new headquarters facility as its only megaproject doesn't need a full-fledged central program management office, compared to one that's regularly building things like power plants, transmission lines, ports, or rail systems. It's not a one-size-fits-all approach to setting up your governance system. In fact, even in the big clients we work with, they'll have different levels of governance for different levels of capital spend.

Q: *What would you say is the most important advice you've shared with your clients?*

A: I think it would have to be that successfully delivering capital projects requires having the right people in the right jobs, with the right level of commitment and buy-in from senior leadership.



A case in point

A large utility company sets the stage for transforming its capital project processes and controls

The business challenge

A large US utility company with operations in several states had decided to undertake a multibillion-dollar program to replace the cast iron and ductile iron pipelines in their gas distribution system throughout a major city. The company's regulator had approved an accelerated cost recovery mechanism to support the high level of capital investment for this and other projects in its jurisdiction.

While the new regulatory environment allowed near real-time rate recovery, it also allowed the regulators to perform management audits of companies involved in subject programs. The company asked PwC to conduct an assessment before the regulator's audit to identify opportunities for improvement and make recommendations for creating a project control environment that would position the company to successfully manage its capital spend and proactively implement improvement opportunities before the regulator audit began.

How PwC helped

PwC began with a program assessment where we identified gaps in the company's project control environment, such as inconsistencies with industry standards and non-compliance with its own internal policies and procedures. We then made recommendations for closing such gaps.

We defined a capital project transformation effort called the Project Excellence Initiative, which focused on identifying and addressing issues that the regulator's audit would likely uncover. Through this initiative, we helped the company secure a number of "quick wins" to make improvements in project controls, processes, and procedures that couldn't wait—such as creating a new quality control specification, developing a white paper on safety management, reprogramming the company's cost model, crafting a new template for project delivery schedules, and clarifying material handling roles and responsibilities.

While the quick wins were an improvement over what the company already had in place, they would not be sufficient to support successful delivery of a 20-year pipeline replacement program. For that, the company needed to define and implement a new future-state operating model that would identify the changes the company would need to make in the next 12–18 months.

Toward that end, PwC worked with executives to define roles and allocate responsibilities (to internal personnel, contracted personnel, and consultants, as well as to the parent company and subsidiary leadership). To reflect these changes, we created a new organization chart and a new RACI (Responsible, Accountable, Consulted, Informed) matrix that clarified decision-making roles for each of the 300+ tasks necessary to deliver the pipeline replacement program.

Finally, we explored with executives the capital project management office (CPMO) model the parent company may want to adopt. (See “Capital project excellence: An enterprise-wide, transformational approach to successful project delivery” for details on the CPMO model). The company began moving towards a hybrid CPMO model that would allow the parent company to assume an oversight role and shift execution responsibility to the subsidiary: The subsidiary would be responsible for delivering the pipeline replacement program as it had the deepest understanding of the local regulatory environment and the unique local challenges that program managers would face; meanwhile, the parent company maintained the process maturity and ability to improve systems across the enterprise that would support this and other capital programs within their portfolio.

PwC then identified a series of initiatives the company would need to undertake to build its selected future-state operating model. Some initiatives were process-focused (such as improving cost management and quality control). Others were people-focused (for instance, ensuring that the right people with the right skills were in the right jobs). Still others were technology-focused (for example, putting needed information systems in place). At the time of this publication, PwC was working with the company to translate all the initiatives into actionable sub-projects and to assign responsibilities and deadlines for each subproject.

The impact

Any company seeking to expand its capital spend by an order of magnitude cannot succeed simply by doing more of what it typically does. Instead, it must fundamentally alter its capital project delivery processes, controls, and systems. The quick wins and operating model changes that came with the Project Excellence Initiative that PwC developed helped this utility company lay a foundation for the organizational transformation it would have to make to successfully manage the pipeline replacement program.

Equally important, these changes enabled the company to answer questions from the regulator when it came in to conduct its audit. The company was able to demonstrate to the regulator that it had a plan, was executing that plan, and therefore had an excellent chance of delivering the program successfully.





Five keys to an effective governance framework

Whatever the size of your company and your capital projects, project governance matters—even if primary responsibility for project delivery is delegated to a third party. Although some capital project owners are sharpening their focus on improving governance structures, many projects still have difficulty delivering on cost, schedule, or quality commitments. Reasons for such difficulties may include the lack of a clear project definition or transparency into project delivery phases, insufficient internal accountability for project performance, and poorly defined contracting strategies.

How can companies boost the odds that their capital projects will deliver the intended value? Establishing the right governance framework is an excellent start. We recommend the following practices.

Clearly define the project

Poorly defined projects almost always result in a suboptimal end product, regardless of how well the project is executed. Yet when a project owner has a good execution track record or is under intense pressure to bring a new facility online, he or she may be tempted to start work before the project is fully defined.



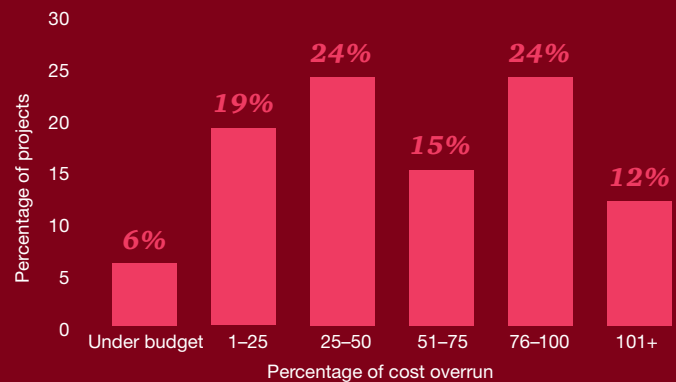
Spotlight on megaprojects

In a PwC analysis of 47 megaprojects (those exceeding \$1 billion) around the world—in areas ranging from rail-ways, road construction, and nuclear power plants to oil and gas infrastructure, utilities, and airports—76 percent of the projects exceeded their budget by at least 25 percent. As much as 52 percent went over budget by at least 50 percent. The average cost overrun of all projects in the study was 88 percent.

As for the projects themselves:

- In the six nuclear plants in the study, the average cost overrun was 157 percent.
- For an energy project budgeted at \$4 billion, the final forecast reached \$12 billion.
- A €3 billion turnkey power project experienced a three-year delay that led to litigation where the project owner sought €2.4 billion in damages.

More than 75% of capital projects experience budget overruns. And more than half experience budget overruns in excess of 50%.



Source: PwC, *Correcting the Course of Capital Projects*, October 2013

Resist this temptation—and take time upfront to define the technical components and commercial objectives of the project before jumping into the work. For example, specify the level of design and performance detail required before a project can progress to the next stage. Ensure that your cost and schedule estimates make sense, define the project scope in explicit terms, and set reasonable expectations.

Indeed, poor estimates during project planning counts among the largest contributors to project failure, according to a global survey of project

management leaders.¹ One vice president of project management and construction at an energy company noted that the most significant hurdle he saw to keeping complex projects within budget was determining how to estimate such a project in the first place.

In our experience, the success of a project is as closely tied to thorough project definition as it is to execution quality. Without sufficient definition, post-contract changes will likely proliferate, introducing further complexities into project delivery.



Client mini-case

Implementing and supporting a statewide advanced gas and electrical meter system

Client issue

A large public utility faced a multibillion dollar capital program involving the procurement, installation, and ongoing maintenance of new, advanced gas and electric meters across its large, diverse service territory. The project encompassed the acquisition and deployment of several million meters and the design, development, and implementation of the IT systems and communication networks needed to support the advanced metering infrastructure.

Action

In its role as independent project advisor, PwC provided the client with three primary functions: advising the project management office and senior company management; conducting macrolevel reviews of the project plan, control environment, and associated risks; and preparing the utility to embrace the changes in technology, functionality, and operations. PwC facilitated communication within the client company. And by building strong relationships with the different business units, PwC was able to identify potential risk and process improvement areas.

Impact

With the support of the PwC team, the client has effectively navigated the significant challenges created by the new, advanced IT, mass meter deployment, and customer outreach and education efforts. Additionally, this transformational project has led to new roles for company employees and has required broad changes in the business processes for numerous departments.



Corruption pressure points

Transparency International, the global anticorruption nongovernmental organization, consistently reports that the \$3 trillion global construction industry counts among the most corrupt in the world economy. Corruption in big capital and infrastructure projects may take such forms as bribes, kickbacks, substitution of inferior materials, poor workmanship, and theft. Though most large-scale capital projects are unique, there are common stages where corruption pressure points emerge. Companies can guard against corruption by using risk assessments combined with a tailored set of preventive and detective controls.

“Whereas poor project performance was maybe tolerated to a degree pre-global financial crisis, there’s now much more scrutiny of projects as they start to exhibit any signs of performance issues.”

—Neil Broadhead, PwC EMEA Capital Projects and Infrastructure Partner

Foster transparency in project performance

The processes required to deliver a capital project typically cut across business functions, organizations, business units, and sometimes geographies. An effective governance framework addresses these complexities and is put in place early in the project lifecycle.

The activities undertaken at the front end of capital project development—business planning, project definition, budgeting and financing, regulatory approvals, and development of project delivery strategy—can benefit from the structure, accountability, and control that come from the deployment of a governance framework. Such a framework is equally important as a project moves through

the activities involved in execution: design, procurement and contracting, construction, cost/schedule tracking and forecasting, change management, commissioning/startup, project turnover, and contract closeout. By applying sound governance principles that support transparency from the start, organizations can boost the odds of avoiding costly course corrections during execution.

Integrated tools and technology can help support such transparency. The right set of tools and technologies, thoughtfully integrated with other corporate performance management tools, can give project stakeholders visibility into every stage of a project and can bring disparate data together and ensure consistency and accuracy across data types.

Establish internal accountability

A good governance framework enables project owners to identify the necessary control tools and procedures to effectively manage project risks and define who is responsible for implementing them. Because large capital projects often have multiple stakeholders, it is crucial to assign, define, and communicate all players' roles and responsibilities. Clarity on this front helps companies avoid redundant control functions or gaps in important management tasks among various groups within the organization.

To further establish internal accountability, companies should build a skilled project team comprising people with the expertise required to plan, organize, manage, and execute the project. For some companies, a centralized project management organization (CPMO) can help (Figure 3). A CPMO's core responsibilities include:

- Developing standardized processes, procedures, tools, and methodologies for managing and monitoring projects
- Defining project management oversight and support needs
- Recommending and assisting with implementation of specific project management processes, procedures, and tools for individual projects
- Providing project management and contract administrative support through advice or through dedicated or shared staff

A CPMO's role, responsibilities, and structure may vary depending on an organization's needs and the nature of its capital projects. For instance, a CPMO might take the form of an assurance provider. It may provide a capital project portfolio management function. Or it might be directly involved in and responsible for project execution.

Figure 3: Capital project organization framework



PwC's capital project organization framework defines the key project stakeholders across the enterprise and defines their roles and responsibilities in relation to various project considerations over the project lifecycle.



Board oversight: A key role in successful capital project delivery

Boards of directors can help provide an additional layer of accountability for capital project management. For example, they can stay involved from pre-concept to start-up, asking questions such as “How does this project align with the organization’s overall strategy?” and “What clear benefits will it deliver?” They can evaluate resources between the project approval and start-up phases, assessing the project management team’s track record and determining whether the right governance framework is in place. They can stay alert for early warning signs of trouble, such as inaccurate estimates, cash constraints, and design errors leading to rework.

Directors can also take time to get to know each capital project; for instance, by taking onsite tours and spending time with the project team. In addition, they can assess the associated risks, including determining whether the organization has built in budget and timeline contingencies; step in if and when a project veers off track by reassessing all contracts and, if necessary, suspending or terminating the project; and conduct a thorough debrief upon completion of a project, including assessing return on investment and lessons learned that can be applied to future projects.²

“A capital project is rarely derailed by a single problem; it usually takes a series of issues along the way—among the owners, designers, and building contractors.”

—Daryl Walcroft, US Capital Projects & Infrastructure Leader

Craft effective contracting strategies

Capital project owners typically appoint contractors to design and deliver their projects, and many contract out the project’s day-to-day construction management. Numerous owners also assume that once the contracts are in place, the project will run itself, so they leave complete responsibility for project execution to their contractors.

This can be dangerous. From the outset of project planning, owners must give careful consideration to their contracting and project delivery strategies. Their project delivery strategy should take into account the level of in-house resources that they have available to monitor and direct performance. It must also account for the unique risks that each project presents in areas including project design and technical challenges.

Once owners select a delivery strategy, they need to shift focus to the clarity and structure of the contractual framework as a whole and assess related risk. Many owners include a variety of performance incentives and disincentives in their agreements to motivate contractors to perform more efficiently. Incentive-based contracting can provide benefits if the organization runs scenario analyses to understand the potential financial impact and confirms that application of the incentive is consistent with performance achieved. Good governance helps ensure that incentives connect directly to valid corporate objectives and drives out any elements that do not. In addition, contract terms should carefully articulate the contractor’s responsibilities to establish, maintain, and report defined performance metrics and specify the owner’s rights to access and audit the underlying project information.



Client mini-case

Keeping systems, controls, and risks in check

Client issue

A major US utility was finalizing plans to construct new multibillion-dollar power plants. Working in a highly regulated environment, the client recognized the importance of strong control processes to manage these projects. The client requested a governance readiness review to determine whether its systems and controls could support projects of this magnitude and complexity.

Action

The client engaged PwC to conduct a preliminary readiness review of the organization. Based on the results of the review, the firm's role was expanded to support overall governance of plant construction and ongoing cost-recovery efforts.

The PwC team then worked with the utility to set up the control environment, and helped its leaders build a risk- and issue-management system, develop a master schedule of project work, and establish a reporting framework for communicating project metrics to management and regulators.

Impact

PwC's capital projects governance framework helped the client assess whether existing processes and structures provided a prudent, transparent, and auditable record of management's actions and decisions throughout the course of each massive construction project.

“At the heart of most projects that are in litigation is disagreement about the cost and impact of change orders from the owner. If a contractor signed up to a fixed price and a fixed completion date, but you continue to throw additional scope and changes at him, obviously he’s going to be able to renegotiate the price and completion date.”

—Anthony Caletka, PwC US Capital Projects & Infrastructure Principal

Establish rigorous communication and reporting processes

A lack of defined performance metrics, and untimely or infrequent communication between project owners and contractors, can raise project costs and cause delays. Contract documents should clearly define expectations regarding the nature, frequency, and level of detail to be included in progress reports to the owner. This helps owners have access to real-time and complete information regarding the status of the project’s performance so they can make meaningful project decisions from beginning to end.

For example, owners need to be aware of evolving risks on the project so they can take the actions needed to mitigate such risks. Similarly, they need current and complete information on potential and pending changes to the work so they can make appropriate decisions regarding the scope of work and related commercial issues.

To effectively communicate about and report on the status of projects, organizations need common sources of information and a standard set of key performance indicators that align with project and corporate goals. Companies also can benefit from reducing the turnaround time for generation of project status reports. Once reports are developed, members of the project team and leadership team need to discuss them and agree on next steps. In addition, project status reports across the company should report the same type of information in the same format and from the same databases. Such standardization helps managers know how to interpret what they’re seeing in the reports and summarize their analyses at a business unit or corporate level.³



Client mini-case

Injecting new life into a company's processes

Client issue

A global energy company needed to apply more rigor to managing “turn-around” projects such as the maintenance of its production facilities to prevent missed deadlines and ballooning budgets. Though the company often worked on several turnarounds at once and had documented its processes meticulously, it rarely followed those processes. As a result, the company missed critical maintenance milestones, which caused cost overruns and delays across the project lifecycle.

Action

The PwC team helped establish a more systematic and cost-focused approach to ordering parts and other components and designed a methodology to establish and structure supplier contracts. The team also implemented a bottom-up approach to budget planning for turnaround projects. In the area of performance management, the work completed by the PwC engagement team gave the client greater visibility into how specific processes, contractors, and systems are working and where improvements are needed.

Impact

The energy company reduced turnaround costs by 10 percent and realized a marked improvement in its turnaround projects. Additionally, the company realized a 17 percent gain in its scheduled compliance during the next turnaround cycle. Extra work order fulfillment times were slashed from five days to one, and simplifying paper-based job packages eliminated unnecessary paperwork and resulted in several million dollars of associated cost reduction.





Taking the first steps

We suggest taking the following steps to begin building an effective capital project governance framework in your organization.

1. Evaluate your current governance framework

Businesses that successfully execute capital projects are supported by an experienced governance and control management team. Members of the team understand the stages of a capital project—business case, design, procure, build, and operate. They are also aware of the significant risks that exist in all phases of project delivery, such as scope growth and corruption in the procurement process (see Figure 4).

PwC has also developed a capital project procedural framework (see Figure 5) that defines typical project considerations by project element across the project lifecycle. In reviewing their current governance framework, managers should focus on organization, procurement and contract management, scope and change management, cost management, schedule management, business systems and technology, risk and issue management, communication and reporting, quality management, and safety management.

Through our experience working on complex capital projects across industries, we have compiled a catalog of typical risks in each of these categories. We have also developed related mitigation strategies that should be considered as part of a comprehensive governance and control framework.

Figure 4: Capital project delivery maturity scale

Element	Level 1	Level 2	Level 3	Level 4	Level 5
Capital Project Governance and Controls	Ad Hoc Processes are recognized by team members but definition is lacking and understanding may be inconsistent between team members. There are no standards of accountability and activities are done on an ad hoc basis	Defined Processes may be formally defined and encouraged by management, but their use is not enforced. Processes are inconsistently applied by team members. Adaptive actions are informally identified but without impact analysis. Monitoring capabilities of project performance by those outside of the project is limited.	Managed Project management processes are standardized and repeatable. Focus is on the project management organization rather than on specific projects or individuals. Project reporting is available at a detailed and summarized level for those outside of the project.	Integrated Processes are integrated with corporate policy and enforced by management. Data is available to allow for proactive action and data driven decision making. Key lessons learned documented.	Sustained Processes are utilized to accurately measure project performance and efficiency on a real time basis. Processes are in place to improve project performance. Management's focus is on continuous improvement.

Source: PwC

Figure 5: Capital project procedural framework

Major capital project teams should review all aspects of the control environment. Using PwC's capital project procedural framework illustrated, the project is separated into a number of elements.

		Project lifecycle					
		Planning	Design	Execution	Testing	Turn-over	Ops/Maint
Project elements	1. Organization framework	Project resource plan, organization, roles and responsibilities		Mobilize and manage labor	Demobilization	Operations staff planning	Ongoing req.'s/skills review
	2. Procurement and contract management	Contract strategy	Contractor qualification and evaluation	Contractor selection and negotiation	Contract compliance review	Trouble-shoot and punch list	Vendor qualification and selection
	3. Scope and change management	Project objectives and scope definition	Detailed project design and scope freeze	Change control		Owner acceptance	Asset change management
	4. Cost/financial management	Project estimate	Project cost baseline	Cost control		Final payment/retention release	Ops & Maint. budgeting
	5. Schedule management	Project schedule requirements	Project schedule baseline	Schedule management		Completion checklist	Ongoing Maint. schedule
	6. Systems and tools	Project systems strategy	Implement project systems	System support and maintenance		Transition to enterprise asset management	
	7. Risk and issue management	Risk and issue mgmt. planning	Risk and issue tracking and resolution			Confirm issue resolution	Ongoing issue management
	8. Communication and reporting	Assess stakeholder requirements	Project status and regulatory filings	Project performance	Asset performance	Project close-out	Operations and fin. reporting
	9. Quality management	Quality plan	Specs. compliance criteria	Quality assurance and control		Transition as-built specifications to operations	
	10. Safety management	Safety plan	Safety training program	Safety trend tracking and incident investigations		Commissioning interface plan	Operation safety program

Source: PwC

2. Review your information systems

Determine whether your information systems—from enterprise resource planning (ERP) and enterprise risk management (ERM) programs to document-management and financial reporting platforms—can deliver the data you need with the right amount of detail and level of integration to manage a major capital project. Accurate and reliable status information is critical for effective and active management of projects. Companies must gather and analyze the large volumes of data that are generated as projects move through their lifecycle, including cost estimates, actual spending, progress toward milestones, and real-time updates regarding risks and issues to be addressed. Consider whether your information systems can accommodate these needs, and make any improvements necessary to ensure that they do.

3. Revisit past projects

Look back at capital projects that met expectations and those that did not. Review contracts and other project documents, and talk with the people who delivered the project. Identify best practices to apply to future projects, and determine what areas need improvement the next time around. This approach can help you build on project successes and prevent repeats of past difficulties.

One key to capital project success is a strong commitment to and early focus on establishing a robust governance framework for managing capital expenditures. Ultimately, project owners must carefully define roles and responsibilities of all stakeholders; monitor the project's performance from beginning to end; identify and mitigate risks as they arise; and ensure that management has the accurate, complete, and timely information it needs to make informed technical and commercial decisions throughout the project's lifecycle.

Pressure to complete projects within tight parameters will only grow. By establishing an effective governance framework, your company can improve the odds that each capital project will produce the long-term value you envisioned when the project was conceived.



Insights from experience



Jason Brown
PwC US Capital Projects &
Infrastructure Director

Observations on capital project strategy

Q: *Where do you see companies struggling most in managing large capital programs?*

A: Many companies predetermine or limit their available contracting strategies based on a perceived “leading practice” process and control environment. However, these leading practices don’t always consider the unique aspects of the project under consideration, which impact the risk environment (and ability to allocate those risks). Once the project starts, many companies experience risks they didn’t anticipate or prepare for. To mitigate

such risks, they should start by analyzing the three sets of main drivers that affect a capital program’s characteristics—and then use the resulting insights to create a process and control environment tailored to those drivers (see figure below).

The first set of drivers relates to the project itself: What are the business objectives? Which of the cost, schedule, and operability objectives will be prioritized? How mature is the design and is new technology being

Our view of the risk and control environment

Different project, owner, and market drivers define a capital project’s risks, which are allocated to project participants



Owners should consider a control environment designed to mitigate the residual risks from their risk allocation plan and not transferred through the contract strategy.

Source: PwC

contemplated? Will there be interference concerns with ongoing operations or the local community? Answers to these questions will inform the project plan, including considerations such as whether the design and construction can be fast-tracked, whether specified technology decisions necessarily limit competition, and how well-developed the estimate needs to be in advance of project approval.

The second set of drivers relates to the owners of the project. Things to consider include the owner's capability to deliver the intended program, their experience with the kinds of activities that will be involved, their familiarity with the local market and vendors and business practices, and their risk tolerance.

The third set of drivers relates to the market and involves issues such as resource availability, overall levels of market capacity, and the regulatory environment to which the project will be subject. Depending on vendor backlogs, they may be unwilling to accept certain pricing arrangements or other risks. If contractors are very busy, an owner may find it hard to persuade contractors to accept lump-sum pricing; however, they may be more open to that option in a slow market.

Q: *What should a company do with its assessment of these three kinds of drivers?*

A: Insights into how all these drivers come together help a company define its risk environment. From there, companies can make risk-allocation decisions—determining which risks they're willing and able to retain and which they want to transfer. That, in turn, should guide their contracting strategy and their approach to establishing the right process and control environment.

Sometimes, a company will have to make tradeoffs. For example, if a company prefers EPC⁴ lump-sum contracts but the market's overheated, they may have to pay a premium to get vendors to accept that pricing arrangement—or hold off launching the project until contractors are willing to accept lump-sum pricing arrangements again without those premiums.

Q: *So is this upfront analysis ultimately worth the time and effort?*

A: Absolutely. Processes and controls are tools used to achieve project goals and objectives, but unless you take the time to understand those unique characteristics, you run the risk of misaligning your objectives and your control environment. I recently spoke with an executive of a European company doing business in the United States. His company was building a replica of a project they had built in other global markets. But through conversation, he realized the delivery strategy they had successfully used in the past would need to be tailored to the local construction market in the U.S. Gulf Coast. Even though this sort of analysis takes time, it's well worth it because it improves the chances of successful project delivery.



Client mini-case

Implementing a capital project governance framework

Client issue

When a large utility was set to transform a power station from natural gas to clean coal, it already faced stiff challenges including tight emission-reduction regulations. But when plummeting gas prices brought the multibillion dollar “repowering” project to a halt, the utility faced a much larger hurdle: how to terminate the project midstream.

Action

Using the PwC Capital Project Governance Framework, which touches on cost and time tracking, communication, risk evaluation, and reporting, the PwC team advised management on how to prioritize its decision making. PwC also provided the client with a detailed framework to document the contract suspension and termination period, providing a clear and concise audit trail that could be used in regulatory proceedings.

Impact

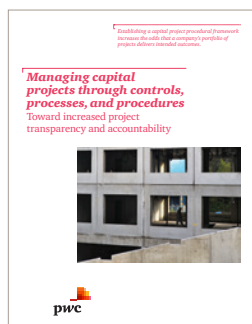
With a clear, organized approach, the utility was able to take a strategic view of decisions throughout the suspension and termination of the project. Also, the PwC team helped the client mitigate termination costs and develop an incentive program to reduce the cost exposure of phasing out subcontractors. It also conducted a detailed analysis and presentation of the incentive program to help both sides come to a mutually beneficial solution.

Endnotes

1. *Insights and Trends*, PwC, 2012.
2. *Capital projects: Is your board doing enough?*, PwC, November 2013.
3. *Capital project management transformation: A standardized enterprise-wide approach to project delivery can help companies achieve execution excellence*, PwC, 2014.
4. A contract type wherein a single vendor provides Engineering, Procurement, and Construction services

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