

Strategies to successfully manage your major project

Whitepaper 1

Thought Leadership Series 10

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About this whitepaper

KPMG's Project Advisory thought leadership series is aimed at individuals and entities who are involved with major construction projects. Effective management of major projects relies on three key concepts: **i)** early planning and organising **ii)** stakeholder communication and project controls integration, and **iii)** continuous improvement. In this first instalment of a three-part series, we outline best practice for early planning and organising of your major project.

Project risk management

Major construction projects are large in every sense – including major size, major cost, major complexity, and major risk. When things go awry, it can also mean major cost and reputational damage. For example, the Kaipara District Council ("KDC") managed the Mangawhai community wastewater scheme between 1996 and 2012, at an estimated cost of \$63.3 million. Yet the actual cost of the project is unknown, due to poor records and systematic information on the amount spent. The project failed to attend to its

fundamental legal and accountability obligations. As a result, the KDC effectively lost control of a major infrastructure project.¹

According to the Office of the Auditor-General's Report November 2013, the principal causes of the project's failures were: poor governance, lack of effective and efficient management and records, and ineffective management oversight. The lesson from this report is that project management on major projects must be equal to the task.¹

Effective management of major projects relies on three key concepts: early planning and organising, stakeholder communication and project controls integration, and continuous improvement.

In this first instalment of a three-part series, KPMG's Major Projects Advisory practice offers eight best practices for early planning and organising of your major project.

Part 1 – Early planning and organising for success

The planning and organisation of a construction project sets the stage for everything that happens after the project gets the green light to proceed. During planning and organisation, you are effectively setting a course for the project – with the opportunity to make course corrections. Once equipment, materials, and manpower enter the picture, much of the planning flexibility disappears.

For the KDC, problems with planning and organisation resulted in poor project governance, time delays and increased cost to the project. The failures were both financial and relationship-based. The project owners failed to implement subcontractor agreements, for example, and lacked the specialist experience and knowledge required for a public private partnership (“PPP”).

Those problems could have been avoided or mitigated if project managers had adhered to the leading practices identified below.

The following are the eight keys to major project success:

1. Assign the project team early

Assign members of the project team right from the very start. Too often, construction owners make the mistake of utilising different teams during the various stages of a project (e.g. concept, prefeasibility, feasibility, execution, start-up and turnover). It’s best to assign a core

team that will remain involved throughout the project to promote accountability, transparency, and responsibility.

The core team should include the following key personnel: project director, engineering manager, procurement manager, construction manager, and commissioning and start-up manager. Others will be added as the project matures from one stage to another. Additionally, the core team should utilise industry professionals and consultants that have successfully completed similar projects in the past, and utilise or develop in-house corporate skills where applicable.

2. Choose the right project delivery strategy

Once the project clears strategic planning, it moves into the prefeasibility stage. At this point, the project team will need to decide on a specific project delivery strategy.

Selecting the right delivery strategy will not only drive the project’s cost and schedule; but also the quality of design, construction approach, and long-term maintenance demands. There are a range of project delivery strategies along the spectrum – from where the construction owner is fully involved in the management and execution of the project; to where the project owner has minimal involvement, and it relies on a turnkey contractor to coordinate all aspects of the project.

Delivery strategies can generally be placed into the following four categories:

- » **Traditional** – (e.g. design-bid-build) where time is not a driving factor;
- » **Collaborative** – (e.g. construction management at risk) where there is a need for early feedback from construction specialists before the design is complete;
- » **Integrative** – where the owner, designer, and contractor all have a stake in the project and operate in the best interests of the project; and
- » **Partnership** – where public and private sector partners work together to execute large infrastructure projects with minimum public agency outlays.

Which strategy is right for you will depend on a number of factors, as well as your desired level of control over various aspects of the project. For example, some owners have in-house engineering departments capable of preparing process and piping designs for others to build. Other owners may be more comfortable handling the purchasing of all the major equipment items.

Whichever delivery method you select, ensure it is aligned with: your scope objectives, resources, speed to market, cost and quality expectations, contracting and contract administration capabilities, and your overall risk appetite.



3. Develop realistic estimates

Project teams need to be both cautious and realistic when developing project estimates. Because company executives are naturally enthusiastic about a project's anticipated benefits, they also can be overly optimistic about cost and time constraints. Have your core team validate initial concept estimates and identify significant estimating errors and omissions. During the design development stage, rely on parametric cost estimates and benchmark data that are recognised industry-wide, rather than on your own internal estimates. Develop pricing models based on a range of possible outcomes.

As the project moves into the feasibility stage, conduct preliminary studies that produce a "design-basis" estimate. This should include all engineering quantities, craft and supporting labour hours, commodity pricing, equipment pricing, project management costs, and internal company costs (e.g. shared services, management time, financing costs, interest expenses) utilising appropriate engineering and procurement resources. Depending on the length of the project, factor in the impact of price escalation on commodities, labour, and equipment. Also provide

allowances where design details for specific project elements are insufficient for preparing feasibility stage estimates.

After the conclusion of the feasibility stage and just before project authorisation, the project estimate (sometimes referred to as the 'budget at completion' or 'performance measurement baseline') should have a predictive accuracy of plus 20 percent to minus 15 percent. If the estimate is prepared correctly, the project team effectively represents that:

- i) the estimate is realistic and achievable;
- ii) that quantities and pricing have been checked and validated by both internal and external engineering resources; and
- iii) that the project team is committed to managing cost within the relative percentage band surrounding the budget estimate.

That's a tall order for a multiyear, multimillion dollar major project – but corporate executives and audit committees expect no less. They rely on the project team's budget representations when the project is approved for execution. Key

factors such as new or unproven technology, difficult or challenging geographic conditions, resource constraints, or fluid materials price escalations will make it very difficult to achieve this desired level of accuracy. It may require additional analysis and studies unless the organisation is willing to accept a lower level of accuracy and a larger contingency.

Your project team will also develop estimates of the time needed for completing the project. The duration and completion dates of interim milestones – such as detailed engineering, long-lead equipment procurement, site work, foundations, structure, mechanical completion, and testing and commissioning – will be discussed and agreed upon. Once again, it is important that experienced Critical Path Method (CPM) schedulers and estimators are involved in the development and vetting of the project's initial schedules. Scheduling errors leading to unrealistic project durations have a ripple effect upon contractors, subcontractors, suppliers, internal resources, operational readiness teams, and other stakeholders. Obviously there can be consequent impacts to the project's financial expectations.





4. Actively manage project risks

Risk management is about identifying risks, both internal and external, to the successful completion and implementation of the project. Project risks, and their attendant questions, can be characterised as follows:

- » **Technical risk** – How mature is the proposed technology? What happens if the technology fails?
- » **Scope risk** – Is the project scope defined adequately in sufficient detail?
- » **Schedule risk** – Are activity durations reasonable? What is our risk of extending the project?
- » **Cost risk** – Are cost estimates based on current market pricing? Have we included allowances for undefined project components, design development, escalation, and other contingencies?
- » **Human resources risk** – Will we have sufficient skilled resources when we need them? How do we retain them for the duration of the project?
- » **Regulatory risk** – Have all regulatory risks been defined? Are any permits or approvals on the project's critical path?
- » **Safety and security risk** – Is craft labour trained in construction safety procedures? Is the project in a locale where there is a significant security risk to personnel and property?
- » **Political risk** – Is the project subject to periodic funding approvals? Does the project have strong political approval and backing?

Early risk planning and identification of risks during the prefeasibility and feasibility stages of the project are essential to develop a complete and accurate estimate of the project's time and cost. Some risks are

within the direct control and influence of the project team, while others are wholly outside the project team's control. Good stakeholder communication and risk management practices can mitigate many project risks, whether internal or external to the project.

Project risks are typically captured in a 'risk register' that summarises both risks as well as opportunities for the project. The risk register is a dynamic document that is updated throughout the project, as new risks are identified and other risks are closed out. The register captures basic risk information needed to prioritise project risks. It is also useful for assigning those individuals responsible for developing discrete risk response plans, monitoring them, and reporting on the risk status.

The project team should determine the cost impact of significant risks and opportunities through quantitative cost risk analysis. Probabilistic techniques such as Monte Carlo Simulation² are used to calculate the amount of reasonable risk contingency that should be carried in the project budget. Knowledgeable project team members develop three-point cost estimates to describe the best case, worst case, and most likely case for individual risk items on the risk register. When these cost estimates are run thousands of times in simulation software, the output is an estimate of the cost risk contingency required for the project. Typically, construction owners elect to reserve contingency based on a 70 to 90 percent confidence level.

Similarly, quantitative schedule risk analysis may be used to determine a realistic project completion date. In this case, a summarised version of the project CPM is used and three-

point estimates of activity durations are used in the simulation instead of cost estimates. Even when experienced schedulers and estimators are used in the preparation of the baseline deterministic schedule, it is often surprising to see the results of a probabilistic schedule simulation. On a multiyear major project, many months of schedule risk contingency may be needed to reach a 70 to 90 percent confidence level. The project team must allow for this possibility and carry additional schedule risk contingency amounts in the project budget.

Risks must be managed throughout the project life cycle. Many major projects get bogged down by delays and poorly planned design and engineering processes. The result is that the project team attempts to accelerate the procurement and construction phases, which is not always possible, especially where project milestones are already very tight. Additionally, any attempt to accelerate the schedule beyond its optimal activity durations will result in additional labour, equipment, material, and contractor costs. Delayed receipt of long-lead equipment is also common, requiring special attention to procurement risk items in the risk register. Of course, delays and cost impacts are the norm and not an exception during the construction phase. Construction risks such as adverse weather, poor contractor/subcontractor performance, safety and environmental risks, resource availability, and coordination among various program components need to be carefully monitored and controlled.

Without proper risk planning, identification, analysis, and monitoring, your major project is likely to experience significant issues.

5. Obtain buy-in from senior management

Every corporate major project must have strong senior management buy-in to be successful. Before the project is approved, a complete project charter, project execution plan, baseline budget, and baseline schedule must be prepared and vetted by the project team. Engineering designs to approximately 35 percent completion, cash flow models, financial analysis, and funding methods all must be evaluated and developed to the point that the project can be visualised and built “on paper.” Most importantly, the project must be strategically aligned with the company’s and stakeholders’ current goals and objectives. The project must be relevant, considered to be the best use of capital funds by senior management, and designed to deliver tangible results.

Typically, the project is reviewed by a capital projects committee or investment committee made up of executives from various company functional units: including the CEO, CFO, strategic planning, finance, legal, marketing, internal audit, sales, and

operations. Regional and divisional managers also play a role, particularly when the project will be built outside of the company’s usual area of operations. The investment committee receives a complete budget approval package to review in advance of the project team’s oral presentation of the project for approval. The timing, format, content, and procedure of investment committee meetings are usually formalised.

Depending on the outcome of the investment committee meeting, either the project will receive full funding approval – or the project team will have to revise, plan, and provide the investment committee with supplemental information at a subsequent meeting. Regardless of the timing, the approval is meant to cover all of the project’s costs from concept to start-up. There should be no incremental or additional funding requests or ‘surprise’ scope change requests.

Once the project is approved by the investment committee and the board of directors, a project sponsor is appointed (if required by the company’s delegation of

authority limits). The project sponsor is a key position for successfully managing your major project, and serves as the direct liaison between the project team and executive management. The role of the project sponsor is to report on the progress of the project, discuss project risks and challenges, and update senior management regarding the project’s financial and other resource requirements. The project sponsor is expected to alert senior management as soon as the project team forecasts a significant over- or under-run against the approved project budget.

6. Develop project specific policies and procedures

As any experienced project manager knows, the success of a major project depends of successful collaboration within the extended project team. The extended project team includes: the construction owner’s team; joint venture partners; lenders; insurers; outside counsel; the engineering, procurement and construction (EPC) contractor; subcontractors; suppliers and others. Collaboration requires a robust set of policies and procedures, clear roles and responsibilities, and frequent communication through approved channels.

While your company may have policies, guidelines, and procedures for managing large capital projects, it is recommended that the project team develop tailored policies and procedures appropriate to the specific needs and circumstances of the major project. Often, company policies regarding things like procurement, regulatory reporting, and annual budget forecasting will be adopted directly by the project team with little or no change. However, to enhance the use of key project team resources such as the EPC contractor, the company’s specific procedures may need to be modified. A good time to develop the project-specific policies and procedures is immediately after the EPC contractor is selected.

Furthermore, because project management systems, processes and controls need to be highly coordinated for a major project to be successful; the project-specific policies and procedures need to conform to one another. Process integration and information hand offs must be carefully defined, especially in an environment where there are numerous third party project team players.



References:

- ¹ Controller and Auditor General, Inquiry into the Mangawhai community wastewater scheme, Independent Assurance Report, November 2013.
- ² Monte Carlo Simulation: <http://www.treasury.govt.nz/publications/guidance/planning/costbenefitanalysis/primer/26.htm>

Project management and control categories

Project-specific policies and procedures should address the following project management and control categories:

Strategy, organisation, and administration

- » Roles and responsibilities;
- » Communication planning;
- » Project infrastructure and systems; and
- » Document control and records management.

Cost and financial management

- » Budgeting;
- » Payment processing and administration;
- » Project cost reporting;
- » Estimating/forecasting;
- » Contingency management;
- » Cash flow reporting; and
- » Value engineering.

Procurement management

- » Procurement planning;
- » Solicitation and source selection;
- » Contracting;
- » Contract administration;
- » Materials management; and
- » Contract closeout.

Project controls and risk management

- » Change order management;
- » Risk management;
- » Design standards and specifications;
- » Regulatory compliance;
- » Quality control and inspection;

- » Environment, health, safety, and security (EHSS);
- » Project management self-assessments; and
- » Lessons learned.

Schedule management

- » Schedule planning and development;
- » Schedule updating;
- » Schedule change management; and
- » Schedule integration.

7. Assign project specific roles and responsibilities

Your project team will function most effectively if each member understands his or her specific roles and responsibilities. In construction, as in other industries, what appears to be self-explanatory is actually more complex when pen goes to paper. Develop the organisational chart so that all the key players and third-party resources are clearly and fully identified, and include clear indication of hierarchical reporting relationships. Names, positions, and telephone/e-mail contact information should also appear in the organisational chart. In addition, develop narrative job descriptions and a responsibilities listing for every resource appearing on the organisational chart. A "short form" of the narrative job description should be published and distributed to all project team members.

Terminology used in the job descriptions should be consistent, and roles and responsibilities should match those identified in the project-specific policies and procedures. For clarity and completeness, we recommend you have both a RACI (Responsible, Accountable, Consulted,

Informed) chart; and a Division of Responsibility (DOR) chart that includes narrative job descriptions.

All of the tools described above should be widely distributed and continuously updated to reflect changes in the organisation or project team.

8. Have frequent team meetings

Scheduling team meetings at an appropriate frequency will enhance collaboration and help maximise the benefits of having a combined project team. Develop agenda templates for all meetings based on subject matter, and always identify specific team members with action items that result from a meeting. A standard set of weekly and monthly meetings should be on the calendar.

For specific interest groups (such as engineering, procurement, construction; project controls; project accounting) and reporting, limit the attendance to team members within the specific functional areas. This will focus the participants' attention on activities within their own sphere of responsibility. Conversely, have your project director schedule regular monthly meetings with his or her senior project managers to discuss project coordination, cross-functional issues, and risks as a group.

Remember to schedule regular meetings with contractors, subcontractors, suppliers, and other third parties to share information about progress, safety and security, and coordination of work. Every contractor should have the ability to contact his or her contract administrator any time to clarify work scope, change orders, pricing, schedule, etc.



CONCLUSION

You cannot successfully manage a major project simply by drawing on industry experience, following project management principles, and applying technology. A critical aspect of success is an effective planning and organising effort.

That is the first key concept which has been outlined in Part 1 of this Whitepaper. It encompasses team assignment, delivery strategy, estimating, risk management, buy-in from leadership, policies and

procedures, assigning roles, and conducting effective meetings.

In Part 2 of this series, we will discuss a second key concept – how to effectively communicate and practice time-tested controls over cost, schedule, scope and quality. No single project director or manager can deliver a successful major project on his or her own. It is a team effort; along with the input, advice, and consent of appropriate stakeholders.

About KPMG Project Advisory

KPMG's Project Advisory services are objective, professional approaches to managing the many risks associated with major change: risks that involve complexity, technology, governance, selection and management of vendors and partners, implementation of solutions and acceptance of change throughout the organisation.

KPMG applies leading concepts and practices, supported by:

- › Experienced practitioners
- › Recognised best practices
- › Effective tools and templates
- › International standards
- › Built-in knowledge transfer

Project Advisory Services can assist organisations to generate significant cost savings by minimising poor selection decisions, costly overruns, misalignment with business needs, poor quality deliverables and failed projects.

Our project advisory services include

INDEPENDENT QUALITY ASSURANCE (IQA)

Is your project or programme on track?
Are the key risks and issues being effectively managed and addressed?

Independent Quality Assurance is KPMG's approach to providing objective, practical and open feedback to senior executives, independently assessing project status, risks and issues. Advice is provided by experienced staff who are not part of the delivery team.

PORTFOLIO, PROGRAMME AND PROJECT MANAGEMENT (P3M) PRACTICES

P3M provides services for the purpose of designing or evaluating portfolio, programme, or project management practices. The objective is to assist in implementing or improving P3M practices to reduce project costs, increase project success and create an organisational P3M support environment which is valued by internal and external stakeholders alike.

LARGE PROJECT AND PROGRAMME MANAGEMENT ASSISTANCE

This cornerstone service of KPMG's Advisory practice is designed to address the full lifecycle of a project or programme, providing an integrated approach to managing large initiatives – the result: significant efficiencies and enhanced outcomes. The methodology incorporates concepts from well-known risk, benefits, project and quality management disciplines to help companies achieve the results they expect during every phase of a large project or programme.

PROJECT RISK ASSESSMENT AND MONITORING

These services provide a highly focused, activity-based approach to project risk management. They provide management with an objective and independent assessment of the risks associated with a business initiative, programme or project, and evaluate the effectiveness of planned or implemented controls to mitigate the risks.

BENEFITS MANAGEMENT AND REALISATION ADVISORY

KPMG professionals help you identify the measurable business changes that you will to see at the successful completion of your project and to tie these into an effective Benefits Management and Realisation strategy which can be referenced in your Business Case. Even for projects where outcomes are "enabling" or "intangible", our Project Advisory team will be able to assist with the identification of proxy indicators and benefit relationships to support the approval of your Business Case and its successful delivery.

PORTFOLIO MANAGEMENT

Effective portfolio management helps large organisations make sound decisions by prioritising the deployment of scarce resources to change initiatives and maximising their value to help achieve the organisation's strategy. Organisations operate in increasingly dynamic environments, which often make it a struggle to satisfy fluid business requirements.

KPMG's Portfolio Management (PfM) Advisory and Assistance services help organisations to develop appropriate processes and capabilities to achieve this aim. We provide practical guidance for conducting capability development, maturity assessments and performance reviews. Our methodology provides a flexible, comprehensive approach that can help our clients achieve their goals.

PROGRAMME MANAGEMENT OFFICE ASSISTANCE

Programme Management Office Assistance is intended to help our clients develop the processes to support a Programme Management Office. We assist with the development of a client's programme office processes and facilitate communication across client leadership to help make sure that enterprise programme initiatives are aligned with the organisation's business strategies. The focus of the PMO is to increase project visibility across client leadership in order to help achieve strategic programme performance.

PROJECT ADVISORY

Our practitioners know that successful projects are the result of clear vision, careful planning, and meticulous execution.

Bottom line: Project Advisory services drive speed and effectiveness of change within your organisation by reducing costs and increasing success.

Leadership Series

Please look for important topics covered by our Project Advisory Leadership Series in the coming months:

- » A three part mini series on: How to successfully manage your major projects
- » Integrated project delivery
- » Building a foundation for a project health check
- » Effective reporting for construction projects: increasing the likelihood of project success
- » Handling labour risk in construction

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