

CONSTRUCTION

A STITCH IN TIME SAVES 9: DESIGNING PROJECTS FOR SUCCESS

The work of architects, engineers, and quantity surveyors in designing and delivering projects that create worth and value for our clients has increased in scale, technological complexity, logistical difficulties, performance demands of the life cycle and commercial guarantees. It has also increased significantly in the degree and complexity of risk transfer from owner to contractor and back again. All parties responsible for the successful execution of construction projects have attempted over time to keep pace with the increasing complexity of projects themselves. To that end, industry has established ways that help us control the outcome, including tools, contracts, and project sponsors.

TOOLS

We have developed an increasing number of tools, and mathematical and logical devices to assist our decision-making, tighten our understanding and control of difficult entities and inform our journey from start to finish in project terms.

- Critical Path Analysis, net/gross, free float, earned value analysis
- Cost planning
- Inflationary models
- Risk buying/subcontract models
- At-risk contracts (PM, CM, MC, CM at risk)
- Specialist contract forms (ICE 5th, GC Works 1, JCT 80, et al, FIDIC, NEC3 Option C, PFI/PPP)
- Target cost, capped and collared, GMP, lump sum, pain-gain
- Design management tools
- Building Information Modeling
- Quantitative risk analysis and all its variants
- Risk transfer, risk allocations, risk management
- Client contingency creation and management

All of these tools are designed to either:

- Create additional value — better asset performance for lower costs, which may include aesthetic beauty, client satisfaction and prestige, as well as commercial value or physical attributes
- Create a lower out-turn cost — lower price or better control of risks



CONTRACTING

In addition, the governance of relationships between the parties has been increasingly regulated through multiple forms of contract. In essence, we attempt to cover all the bases through documented risk allocation between the parties, risk transfer between the parties, calculation and management of risks held by any single party, and utilisation of contingency. In leading organisations, a great deal of resources and effort go first to avoid and then to mitigate risks.

SPONSORSHIP

With the elusive goal of finishing on, or ahead of schedule, under the cost forecast, and with an end product that does what it was designed to do, it begs the question about the value side of the equation. For a while, value creation seemed to be a forgotten art in some quarters, with the explosion of modern building, new materials, new structural analytical techniques, and the advent of computing permitting more extreme structural forms.

Many major clients have rightly identified that there are risks and opportunities when trying to create value in this way, and have created formal sponsorship roles. The sponsor or steward is effectively the internal client, paid to ensure that the business case (gap between value created and cost incurred) is maximised. The sponsor has two principal roles: 1. Determining the initial project brief or functional specification, which needs careful iteration to balance the cost to achieve an outcome that maximises return on the investment, and; 2. Ensuring that the delivery cycle does not inadvertently diminish value but does achieve the outcome at best cost and time scale.

With all of the efforts directed at the agreed-upon outcomes, we should be able to consistently add value to a scheme, as well as discover ways to build it out more economically. In reality, of course, personal motives, power and influence, relationships between sponsor and deliverer, sponsor and client body/board, and the innate uncertainty of economies, construction markets, construction risks, contractual matrix, people/personalities, systems integration issues, and effectiveness warranty/guarantees all conspire to undermine our plans.

BACK TO REALITY

Despite our best efforts, so often it still goes the wrong way, and the venture delivers a reduced, rather than an enhanced, result, compared with the original business case. To compensate for this, some of the project commissioning bodies add a huge contingency at the outset to accommodate the later detrimental shift in business case (60 percent in UK HMG guidelines).

We have come to a place where we treat cost increases as normal — even foreseeable. This is what passes for being under control: forecasting overruns. This planning for failure bears little resemblance to assessed risk and has little science or analysis. In reality, it is an admission of not being able to cost plan and programme the logistics realistically at the start. If you don't understand what should be the appropriate price, then you shouldn't commit until you have had some coherent advice and cost-planning guidance from people who do know good value in your field.

PREDICTORS OF SUCCESS: PROCESS AND PEOPLE

The most competent, professional, and assured teams and businesses with great track records can become blind to unnecessary risk. Whilst there are many things that will be pointed at by project managers that they find helpful (repetition of past solutions, off-site prefabrication, early contractor involvement) these are not truly necessary conditions for success.

Conversely, there are common elements we find to be missing when analysing troubled projects. There are the things that foreshadow major problems that result in the failure to deliver the promise of the original business proposition. There are also the elements that need to be present in order to you're your charter. Without these common elements in both process and people, you are never likely to succeed. They are necessary conditions for success.

PROCESS

Clear functional specification from the sponsor

- Matched by an appropriate project design brief
- Matched in turn by:
 - Clear specifications
 - Cost plans
 - Construction programme
 - Risk allocation
 - Risk register
- Matched in turn during procurement by:
 - Contract form
 - Procurement and engagement of main contractors
 - Control of change

These are the early stage activities through which the sponsor sets out clear functional requirements and around which the development and design team can explore multiple options, enabling the project sponsor to select the single preferred option, which can then be refined in a more detailed design up to the appropriate point for procurement. Along the way the remaining elements are completed and the client should be ready to commit fully to the funded execution of works.

Various leading companies that do this work well, manage their design and planning phase particularly well, and have the following in common:

- Robust independent sponsorship that gives clarity of business case drivers and requirements
- Well-defined stages of project development
- A gated process that checks the scheme in the round before moving on to the next stage of development, sending the scheme back for further work if it fails to meet the acceptance tests of the gates.

There are a variety of websites that can recommend a gated process. The UK Government OGC (now defunct) website is a well-trying and tested one. However, most major organisations are aware of the need for a gated process and deploy one. The challenge is that this situation can provide a false sense of security. The most common failings we see here are that, although a process is being followed, it fails to provide appropriate stewardship and assurance because:

- Sponsor lacks rigour and authority
- Disconnected proposition — i.e., The cost plan does not meet the spec, doesn't meet the functional spec, doesn't meet the programme, etc.
- Project team rushes the gate — issues of reputation, personal reward, corporate behaviours
- Review Board does not function appropriately in the gate itself

Even when there are process, gates, and reviews, in today's corporate world we note that project teams are typically more concerned with arriving at the gate and getting through it, than ensuring the quality and rigour of the solution. The company system of management by objectives, behaviours and cultures, perceptions and definitions of failure, all tend to reward the wrong behaviour for both the project team and sponsor in these early stages. Their perception is that it is better to arrive on time with a proposition that is still not fully fledged but good enough to get through the gate, than to delay in the effort to find a better solution. In addition, it goes against their nature to delay. Project teams and engineers are often highly motivated, highly competent drivers who thrive on completing a complex task on time against seemingly impossible odds, leaving a lasting monument behind them. This does not necessarily play out into the right behavior for maximising profits and minimising risks in a complex project environment.

(These difficulties of balance don't only affect construction projects — think of many IT developments and implementations you may have experienced, with attendant difficulties. Their root causes are often the same — stemming from the early definition and over-optimistic/rushed development of the solution.)

These issues are often compounded by the review processes.

When presented with the progress report, there is a short space of time for boards to properly review the project team's work and many board members do not have the skill to make a proper analysis, even if they had all the data, which usually they don't. Papers are short and lack detail. Questions are drilled, possibly at random, to try and assess how well the team is on top of their project, and how robust the business proposition is. This is often a thorny, messy process driven by the character and nature of the individuals on the project team and the review board. Not necessarily a stable basis for decision-making and consistent optimisation of outcome. In the end, the board is presented with a clear recommendation and the team is ready to go.

In the best projects, the gated review process is much more than compliance: it is active management and leadership that enable the avoidance of risk and the maximising of opportunities that lead to better business outcomes. The results lay the team open to challenge over their working assumptions and it is through that very dialogue that the team and the wider business will become comfortable with the proposition they are undertaking, rather than blind to the risks and opportunities that lie along the way.

PEOPLE

Identifying the right people, and managing their roles, interactions, and behaviours is a critical component of a successful construction project. Considered the soft side of the equation, it is often given less rigorous management focus. The core components of people management include:

- Competence — ability to understand and discharge one's responsibilities well.
- Team Structure and Size — the right team structure to discharge all the necessary responsibilities and duties efficiently and productively.
- Leadership — the ability to clearly set the direction, communicate in a manner that is understood, and enable everyone to participate to their fullest capability — taking pride and enjoyment in their work.
- Alignment — the right motivation and engagement of every individual within the team: pulling to common goals, motivated and wanting to achieve that goal, willing to appropriately subjugate self-interest for the common good.

CORES: CHANGE ORDER REDUCTION SYSTEM

- The best and most effective way to eliminate change orders and to ensure that construction projects are delivered on time and within budget is to identify the root cause of the potential change or delay before documents are issued and construction commences. That is the primary goal of Navigant's Change Order Reduction System, or what we call CORES.
- With Navigant's CORES Methodology, a team of highly trained professional consulting engineers and architects carefully review plans and specifications, prospectively, prior to bid or issue for construction for the on-site execution of the work. The CORES Methodology is specifically designed to uncover potential design errors, omissions and interdisciplinary coordination conflicts that can affect procurement, construction and the associated schedule of performance, thus virtually eliminating RFIs, change orders, and claims.

- Upon the conclusion of the CORES review, we deliver to the client a catalogue of our findings in an easily understood and manageable analysis tied into a fully functional database. The CORES analysis identifies the problem or conflict, sheet location, specification section, consultant discipline, and trade affected to highlight areas of concern for the design professionals.

The CORES Methodology has helped clients save significant sums in unplanned costs and schedule delays by acting proactively to eliminate claims and disputes before they arise.

COMPETENCE

It is like the airline pilot running through the preflight checklist for his 1,000th flight. He may know it backward and forward, but must give it his full attention and effort because the items on that list are critical every time. The same is true when choosing people for the team — a successful recruitment process cannot be run on autopilot. The interview and selection process can be made much more rigorous if an evidence-based approach is taken, with detailed experience checks from reliable references that address specific responsibilities. People can present an inflated view of their experience, but you need to find the individuals who have been in the trenches and, more importantly, can prove it. Often it seems project teams are selected on a less unstructured process: availability, or they built a similar road before but in a different role than you are filling currently on this job. It is not a box to be ticked off but more of an investigation to ensure that you are getting what you need in each position.

TEAM STRUCTURE AND SIZE

Teams achieve their highest level of productivity when there is clarity in accountability and responsibilities. Without such clarity, it is rather like playing rugby with no positions on the field and allowing anyone who feels like it joining the scrum or the line out. Clarity of responsibility and accountability is a basic concept, but is often overlooked.

An effective tool to ensure that the right players are in the right place is our People Warranty system, which provides simple metrics for the proper engagement of the line manager with his subordinates. It also identifies the degree of competence required in each subordinate to consistently discharge his or her primary responsibilities within the project team. The straightforwardness of this approach, and the manner in which it is presented, has proved particularly effective. It secures personal representation or warranty, which is highly valued by the individual, who does not want his or her reputation to be impeached. It has consistently succeeded to engage, where more bureaucratic HR processes have failed.

Some teams are so large that they spend as much time managing themselves as managing the project, which is cumbersome and adds risk rather than mitigating it. In addition, teams above a certain size run the risk that the team leader (project director) will lose touch with the job, and begin to believe their own self-reinforcing viewpoints, without real-time testing. Dashboards and metrics undoubtedly have their place, but so do the fundamental matters of meeting people face-to-face.

For clients, some best practice in team size is evidenced by Peel Holdings and Stanhope — two extraordinarily successful UK developers who maintain a small central core of experienced people, who lead and drive their schemes very ably and creatively, without the burden of a large team. They found this approach maximises value because they are always focused on the critical matters and ideas, not the machinations and politics of the team. The details become the responsibility of others.

LEADERSHIP

There are a variety of behaviours and routines that can help leaders remain connected. The most appropriate routines need to be identified and maintained:

- Weekly driving/walking the site(s)
- Speaking to front-line workers without interruption
- Listening to suppliers in camera at senior level
- Skip-level meetings with own team

Advancing an appropriate public persona and providing accessibility are key. Leaders need to be seen to listen, act, and follow up on resolution of matters that are unhelpful to the goal or that are good ideas for improvement. This level of engagement wins respect and trust and visibility that motivate the right behaviour in others. It also provides the necessary intelligence to ask the right effective questions in their own meetings.

ALIGNMENT

Fundamentally, the project will achieve the best outcome if all parties are focused on achieving the best outcome for the client all the time, and make decisions that align to the client's needs. Over the years we have seen ways that people strive to achieve this goal. There are project charters signed by the participants, meeting room exhortations, early engagement of suppliers in creating the solution, team talks, briefings, project newsletters, and the like.

Unfortunately, no matter how much everyone says they care, the primary allegiance from all parties is to their own balance sheet (if consultants, contractors or suppliers) and coupled with the (not uncommon) competing motivations in the client team, this in practice makes for a large number of risk planes.

Within the client's own team, differences may also abound. Sponsors sometimes believe that their task is to get the most equipment or best (most expensive) solution for the price offered (rather than the best business case). This can result in over-specification, late changes and gaming of the supplier — none of which is conducive to reducing commercial or delay risks. The client project management team is often most concerned with keeping everything on track against deadlines, or at best driving for deadlines in time and cost targets, during the development phase, rather than securing a holistic proposition.

Given the different commercial and personal allegiances in the sponsor, client, project management, and suppliers' teams, all parties may well honour their overt commitment to achieve the client brief. They even commit to a contract that incentivises reducing costs, until the time comes when their own balance sheet is at risk, or they perceive that the target cost can be increased through operation of the contractual entitlements, or their own margin improved, even though the client's cost may be increased more than strictly necessary to deliver his business case.

VALUE OF AN INDEPENDENT PERSPECTIVE

This is one reason why we are seeing major clients move steadily to recognising the value of truly independent advice. They are choosing to engage independent testifying experts in a different way — applying those experts' experience, skills and rigour to evaluate their early project stages, avoid risk and ensure that their projects will not be in the 50–60 percent of projects that run over in time and money, or don't achieve what they originally set out to achieve — rather than waiting until the problem has occurred and become irreversible, they ask us to help by opining on or reducing their losses as expert testifying witnesses.

The independent review is conducted by those who are not motivated by career path and line management, but interested only in testifying as to the rigour of the proposition, and are able to provide impartial advice to the board and the project team.

One example of this would be the work of the Independent Investment Advisors for Transport for London, who review their capital and maintenance programmes. Other examples would be work that Navigant has provided to a rail scheme in Africa, and a U.S. metro system. In all instances, these independent voices are relied upon to provide impartial advice, helping the in-house project teams secure the best value for money and mitigate unnecessary risk that gives them the best chance of a clear run to completion with the greatest chance of success under complex difficult conditions.

NPV²: NAVIGANT PROJECT VALIDATION & VERIFICATION

The scale of the unnecessary escalation-in-cost/drain-in-value is commonly assessed to be between 10 percent and 30 percent. The sums involved can be £100 millions and are often avoidable (or at least can be mitigated for considerably less) had the needs and risks been properly identified pre-contract with the main contractor. Additionally, according to a recent independent review, more than 50 percent of schemes run over time and cost.

The frequency and scale combined paints the picture of an industry rife with inefficiencies. There is strong motivation to create/renew assets and stanch the unnecessary bleeding of billions of pounds every year.

WE CALL THIS NPV²: NAVIGANT'S PROJECT VALIDATION & VERIFICATION

NPV² is a series of health checks that ensure the project business case is solid, and that it is being at least maintained if not enhanced through to procurement and beyond. NPV² is about confirming at every single gate that the project is in the best possible shape and is not bearing unnecessary risks or costs, combined with recommendations based on our experience, and the review of the project status with the project team. All checks are directed to improve our client's NPV return from the project.

This methodology fully incorporates the important process and people components discussed above. In this way, unnecessary risks are avoided, providing high certainty and lower costs.



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About Navigant

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SUMMARY

So in summary, we find that most major projects have various forms of project controls and governance in place. This is important for the client's team and also for the numerous main suppliers. However, no matter how effective these processes may be, other essential ingredients are necessary for a successful outcome to be realistically likely:

Self-evidently, the right people with appropriate experience, skills and behaviours are mission critical.

Moreover, the alignment of all parties is essential in creating value and reducing costs and risks favourably. Unfortunately, this alignment is extremely unlikely given the fragmented nature of a major project team and the commercial pressures driving their individual interests. Whilst mechanisms such as pain/gain share may create tolerance and overtly encourage aligned behaviours, in reality the commercial pressures on the individual balance sheets of the suppliers involved make alignment under duress unlikely.

The role of an independent advisor, capable of interrogating the solution at key stages during development, design, delivery and commissioning, significantly enhances the prospects of success, by providing the client with lucid analysis and insight coupled with clear recommendations. This enables problems to be identified and resolved at the earliest opportunity in the project, rather than being suppressed until the project is in execution, when the risk and commercial impact from an unexpected event is significantly greater.

The old adage "A stitch in time saves nine" holds true.

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