

# CONTRACT AND COST MANAGEMENT

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The purpose of IGLC championship white papers is to explain the area of inquiry and to invite researchers and practitioners to collaborate and to contribute papers. Our first task is to define the championship.

## Definition of the championship area

The theme of Contract and Cost Management covers the legal and financial infrastructure which underpins the design, construction and operation of buildings and structures and can be aligned to the primary functions of the production management model. Central to this theme is the investigation of the relationship between risk and reward across the project and the search for radically new lean definitions and methods of allocation and management.

Construction is widely accepted as a high risk industry subject to much uncertainty and variation with production systems redesigned to some degree for each project phase (definition, design, assembly, commissioning), and to a lesser degree, redesigned every day. Variability in the composition of the project team, client requirement and design solution challenge management activities at all levels and the constellation of interdependent tasks that change daily give rise to dynamic problem solving activities embedded deep within the processes. At their best, these activities form an agile, responsive project delivery process, at their worst they cause immeasurable damage to the project success as a result of wide spread action without co-ordination, integration or collaboration.

The challenge is to maintain the problem solving abilities but prevent unilateral action within a satisfactory economic framework. This framework includes and derives from the procurement systems which initiate and govern the design, construction and operation of a structure or facility. Procurement systems set up the relationships between parties enshrining within a contract/s the scope of work, the allocation of obligation and risk and the mechanisms for agreeing costs. The parties to a project span from the Client through consultants and contractors across to trade crews, suppliers and manufacturers. All are involved at various points in the design, delivery and operation of the structure or facility. In an industry where most cases of dispute result from unfulfilled expectations and many of the management activities focus on the symptoms rather than the root cause of the problems suggests the focus on risk has tended to overlook the primary risk that value not be delivered to the client within client-specified constraints, and that the best way to manage that risk is to assure project success.

There are three aspects to the investigation of this theme:

1. The first task is to design the contractual structure of the project and to establish its objectives and constraints (relational contracting, setting target values and costs) in the pursuit of value generation and waste elimination.
2. The second task is to manage project execution toward those objectives and within those constraints (project governance; designing to target values and costs) and
3. The third task is to learn from breakdowns (unintended deviations from standard/plan) and from experiments (intended deviations from standard/plan).

The three aspects are of course interrelated and require the critical evaluation of the purposes, products and processes of contract and cost management. The fundamental issue being if and how the management of projects should and can change in response to new thinking in the management of production (designing and making) on those projects. For example, is it feasible and optimal to continue to procure, contract, evaluate and pay in traditional ways on projects implementing lean project delivery?

## **The Research Agenda**

Construction cost control has been based on the thermostat model; i.e., budgets allocate money to cost accounts and spending is tracked to detect negative variances from budget, which triggers corrective action. This approach parallels the generation of detailed activity schedules at the beginning of projects, which allocate time to activities. Unfortunately, the only thing we know for sure about a detailed schedule or budget at the beginning of a project is that the project will not be completed according to that schedule or budget. The level of detail must be matched to the degree of uncertainty so we don't confuse speculation and desire with a real plan. The allocation of both time and money to activities must be done in progressively greater detail through the course of a project. And rather than concentrating effort on tracking actual spending against those allocations, we need time and cost management systems that help project teams make good decisions regarding time and cost. This approach is being applied at the Boldt Companies; a construction contractor based in Appleton, Wisconsin. Cost reports are simplified and cost control is distributed to various levels in the company, following a philosophy of distributed decision making rather than central command. The goal is to have real time information on project cost and schedule status, and to continuously scan for risks and opportunities, producing for clients no less often than monthly, a set of alternative action plans for completing the project successfully, while maximizing customer value.

It is clear that collaboration underpins all Lean Construction activity. It is equally clear that the primary barrier to collaboration is the ability of companies to maintain their economic integrity. This applies equally to all project participants be they Clients, contractors, trade crews, manufacturers, consultants etc. Each party desires to reduce their risk exposure and protect themselves against variation and uncertainty by including contingency (time, money and materials). Where we talk about "lowering the water in the river" to stress the system and reveal constraints in project delivery, contingency forms a major part of the "water" upon which the project floats. The Last Planner System™ delivers time compression and goes some way towards JIT in reducing materials contingency but money buffers have yet to be fully addressed. How to remove contingency and maintain economic integrity is challenging – open book cost reimbursement contracts<sup>1</sup> can move towards this helping money flow across organisational boundaries in search of the best project-level investment opportunity. . So there is a need to be creative in incentivising performance and negotiating targets for delivering best value that fairly rewards risk management for all parties and this needs to be a design requirement for contractual structures. Perhaps the crucial item here is defining best value. This certainly is not least cost although many construction projects are let, managed and judged on their cost performance.

Questions arising from these issues include:-

1. How can value be redefined in order to shift the focus from least-cost based judgements.

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<sup>1</sup> IChemE Green Book Contract is an example of reimbursement contract widely used in process engineering

2. How can the differing values across the project delivery process and/or for differing project parties be defined and reconciled?
3. Would the evaluation of benefits or outcomes provide a new way of thinking about value?
4. How can contingency (money) become more visible and then be compressed?
5. Cash flow is essential for business. How can the activity of making payments across the supply chain be improved? Can we develop radically new methods for making cash flow?
6. Budgets & targets are an important part of the investment decision for Clients. They are also critical for bidding strategy and business case decisions for the supply chain. How can we radically change our thinking about defining these?
7. The Theory of Constraints (Goldrat) showed us that utilisation was not a good measure of profitability and throughput was more meaningful. Are we similarly measuring the wrong things and believing projects to be profitable erroneously?
8. Lean accounting is a simplification of accounting processes with much less emphasis on traditional labour, plant, material and overhead costing. What can be learned from this for construction accounting?
9. New methods of contracting that require collaboration and integration across the supply chain demand different behaviour from the parties. What sort of behaviour will be required and can behaviour be related to the contract clauses (e.g., see IGLC and LCI papers on relational contracting)?
10. How can trust be developed across the supply chain ensuring fair payment within a transparent economic framework?
11. Stability is a precursor to change and innovation, how can we move construction towards economic stability and level demand?

## **CONCLUSION**

The above points are by no means exhaustive and it is expected that these areas will be refined and new areas will emerge as the theme of Contract and Cost Management develops in the coming years.

Your comments and suggestions for improving and expanding the above are warmly requested. Our task as a learning community is to dig into the details, evaluate experiments, and push our knowledge beyond its current boundaries.