

IGLC-12 White Paper: Project Financial 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

Maximising value and minimising waste are the fundamental objectives in Lean thinking. These objectives should be pursued in the entire range of project activities, in the core production process as well as in the management activities connected to it. This also goes for financial management activities.

The basic objectives for development of the projects therefore draw our attention to the following lines of analysis and development:

1. Developing Financial Management concepts and tools adequate to support Lean Project Delivery
2. Eliminating non-value-adding products of Financial Management
3. Eliminating non-value-adding activities “within” Financial Management itself

Line 1 focuses on developing concepts and tools to identify any kind of waste in the core process and to support essential processes in lean project delivery, e.g. ensure relevant information is available for decentralised decision-makers (enhance transparency in the project and support the “Flow of Commitments”).

Line 2 focuses on eliminating non-value-adding products of financial management. This includes a critical review of which results and products are adding value to the core processes

In line 3 lean principles are applied “within” financial management itself, i.e. analysing and developing the processes of financial management to produce the desired results with as little effort as possible.

Of course these lines of development should not be understood as separate, but as intertwined and integrated processes. Line 1 and 2 shall be evaluated against each other, i.e. evaluating the resources spent in making the financial results against the value of the results/tools to the entire process. Likewise processes 2 and 3 are linked, consisting fundamentally of the development of products and processes (of financial management) which must always be considered jointly.

As this is a new IGLC championship, we propose to focus on one topic as a start: Line 1 Developing Financial Management concepts and tools adequate to support Lean Project Delivery though we welcome contributions on other topics relevant to project financial management.

We further propose as a start to follow two directions of inquiry within the above mentioned topic:

- to focus on concepts, methods and tools to support the discipline “designing to target cost”
- to focus on financial concepts and information to support what Howell and Macomber (2003) have named the “network of commitments “ and “flow of commitments”.

Designing to target cost

One of the big problems in construction is the amount of wasted effort, particularly in the design phase, due to missing or wrong directives – or lack of ability to deal with those directives. One of the basic directives in a Construction/Capital Investment project is the budget. Current practice in design involves a lot of rework because the (first) design does not meet the budget requirements. Designing to target cost is a method for avoiding rework.

We have found in the world of consumer product manufacturing, the product development technique ‘designing to target cost’. In brief, a manufacturer sets a cost for a product to be developed that will allow an acceptable profit given the price that product is expected to fetch in the market. That target cost for the product is then split into target costs for each functional system within the product. In effect, the ‘buyer’ is setting the price he is willing to pay for that system. Obviously this can be extended to subsystems and components, and even to parts of components where the relevant buyer is able to impose on or negotiate prices with their suppliers.

Target costing is a method for systematic improvement of product profitability. It is used in the initial development of a product, in subsequent product modifications, and in the manufacturing of the product throughout its life, where the focus shifts to the production processes themselves.

We would like to adapt and apply this approach to construction, where, traditionally, cost has been an output of the design process. Target costing reverses that relationship, making cost a criterion for the design. If we get smart, we can learn how to model both product and cost in a way that allows easy alignment of the one with the other. Further, the psychological impact appears to be significant. Cooper & Slagmulder¹ claim that

¹ Cooper & Slagmulder, *Target Costing and Value Engineering*. Productivity Press, 1997.

pursuing target costs yields better results than pursuing the indefinite goal of cost minimization.

The Boldt Companies very successfully used a rudimentary form of target costing on a design-build project, even though target costs were only set at the facility system level². We know that project management companies, design-build contractors, both general contractors and specialty contractors, as well as many designers typically use some form of target costing, though not by that name.

Research Topics

As this is a new area of research, descriptive studies are much needed to determine the extent to which designing to target cost is currently done in construction, how and why it is done, and how well it is done.

Another area of research needed is in translating/applying concepts and techniques from product development to construction projects, recognizing their differences.

Some research questions related to the differences between product development and construction projects:

1. In manufacturing's product development, the firm that sets target costs typically can help their suppliers achieve them. Is or can that be the case in construction? We don't seem to have many Toyotas.
2. Cooper & Slagmulder report the use of a pre-design-freeze period in which target costs established in design are adjusted/tested against specifics regarding how the products are to be made; e.g., labor costs, which plant/supplier, exchange rates, etc. Does or should that have some counterpart in the transition from designing to making in construction?
3. What tools can be used to achieve target costs in construction? Cooper & Slagmulder mention kaizen costing, various forms of value analysis (Zero-look, 1st-look, 2nd-look), teardown methods, and others.
4. In manufacturing's product development processes, 'suppliers' are brought in after component target costs are established. One possibility: A design/build electrical contractor is involved in setting target costs all the way down to switchgear, but the switchgear supplier is selected based on a competition in which cost is fixed and selection is based on functionality/quality. Does that happen now? If so, in what circumstances?
5. We suspect that it is easier to align functions with physical components in the case of consumer products than in capital facilities, where they are much more intertwined, with components supporting multiple functionalities. What difficulties does that pose for target costing and for achieving target costs?
6. Delivery time is not considered in calculating waste-free or necessary-waste-free costs of products in manufacturing because they are assumed to be available at point-of-sale. However, that is not true for construction. Implications?

² This case study will be presented at IGLC 12.

7. It seems that target costing can be used in construction in at least two ways: a) to lower the cost of standard products or subproducts, or b) to assure that available funds are used to achieve the greatest functionality/quality & timely delivery. The Boldt Companies' project mentioned earlier was an instance of the 2nd, whereas the 1st is the traditional product development application. Is there opportunity for application of the 1st use of target costing in construction? Perhaps by fabricators? Do product suppliers or fabricators currently practice target costing in their product development processes?

More research questions:

8. How to link the profits of the provider organization³ to the target cost?
9. How to establish target costs...
 - a. for the entire project?
 - b. for facility systems?
 - c. for facility subsystems?
 - d. for components?
 - e. for parts?
10. What can be learned from the more general practice of designing to target characteristics; e.g., designing for the various –ilities: constructability, reliability, durability, sustainability, etc.? Is it feasible to generate a set of alternative designs that conform to desired criteria as opposed to evaluating alternatives after they are generated? Given that estimates are now typically done perhaps no more often than once a month, how can cost evaluation feedback be done ‘instantaneously’?
11. When cost is the target characteristic, driving design to target cost requires knowing the cost of realizing a design, a competence more often possessed by fabricators and builders than by architects and engineers. Must design then be co-produced by a team of specialists knowledgeable as regards each specific target? And if so, how should the design process be organized and managed?
12. How to extend target costs to product suppliers, as distinct from subcontracted providers of services?
13. What role does conceptual estimating perform in the target costing process? Should we rather use the term “cost modeling” than “conceptual estimating”?
14. (How) can value engineering (sometimes referred to as ‘value management’) be used to achieve target costs without sacrificing quality, functionality, or project duration? How about other tools used for this purpose in product development; e.g., quality function deployment and design for manufacturing and assembly?
15. How to handle failures to achieve target costs in the design phase?in the construction phase?
16. How should contingencies be established...where, how much, by whom, using what processes? Can we treat financial contingencies as buffers against variability or uncertainty?

³ We use the term “provider organization” to indicate the organization that has responsibility for delivery of the facility to the client. This may be a design-build firm, a joint venture, a construction management firm, etc. Analogically, the provider organization plays the role of the manufacturer that launches a product development project.

17. A speculative question: A contractor is involved in fixing target costs for some ‘object’ in the facility hierarchy, then commits to delivery for a fixed price. They can still make additional profit by lowering their production costs below the target cost. Unfortunately, this could be facilitated by sandbagging in design—but is that a problem if target costs are achieved, reflecting delivery of value to the customer? Over time, the contractor would be forced to innovate further in order to maintain a previous profit margin.

Financial management information to support the “Flow of commitments”

The terms “network and flow of commitments” was introduced in Lean Construction by Howell and Macomber (2003).

From this point of view, financial information shall support the creation and refinement of the Network of Commitments. The financial data shall be used to determine the current position/progress of the project as a basis for a common appreciation of the present situation in order to create agreement about the scope and kind of future strategies/actions, which are adequate in order to reach the objectives agreed upon.

The aim being to create commitment about adjustments of plans and actions, the financial information shall accommodate individual wishes and demands from the different stakeholders. The financial management system should be able to produce information on a “pull” basis.

The level of detail and precision of the financial data shall follow the development of the network of commitments. The level of detail shall be determined by the need for financial information in order to advance the flow of commitment at the current stage of the project.

Whereas “Designing to target cost” can draw upon existing disciplines/tools both within and outside the construction industry, the “Flow of commitments” approach is entirely new, but nevertheless promising. Contributions within both directions as well as related to other aspects connected to Lean Project Financial Management shall be welcome.

Request

We plan to maintain a bibliography and a library of innovations relevant to this championship on the IGLC website. Please send us your favorite books, papers and stories for posting.