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Value + Price - Cost = Next

Stuart D. Peaslee, AIA

Cut to the chase, what is the bottom line? A key to successful project cost analysis, is the use of two different methods, Check & Double-check, '...measure twice, cut once.' First question, how much does an estimate actually cost? It may be a factor of experience, in general, inexperience underestimates, too much awareness is a tendency to overestimate.

An allowance for three estimate levels, Conceptual / Detail / Contract might go as follows:

project size - $25,000 to $200,000: allow 40-80 hrs, $1000 to $5000, duration: 1-4 weeks

$200k to $2 Mil: allow 80 - 500 hrs, $10,000 to $50,000, duration 2-6 months

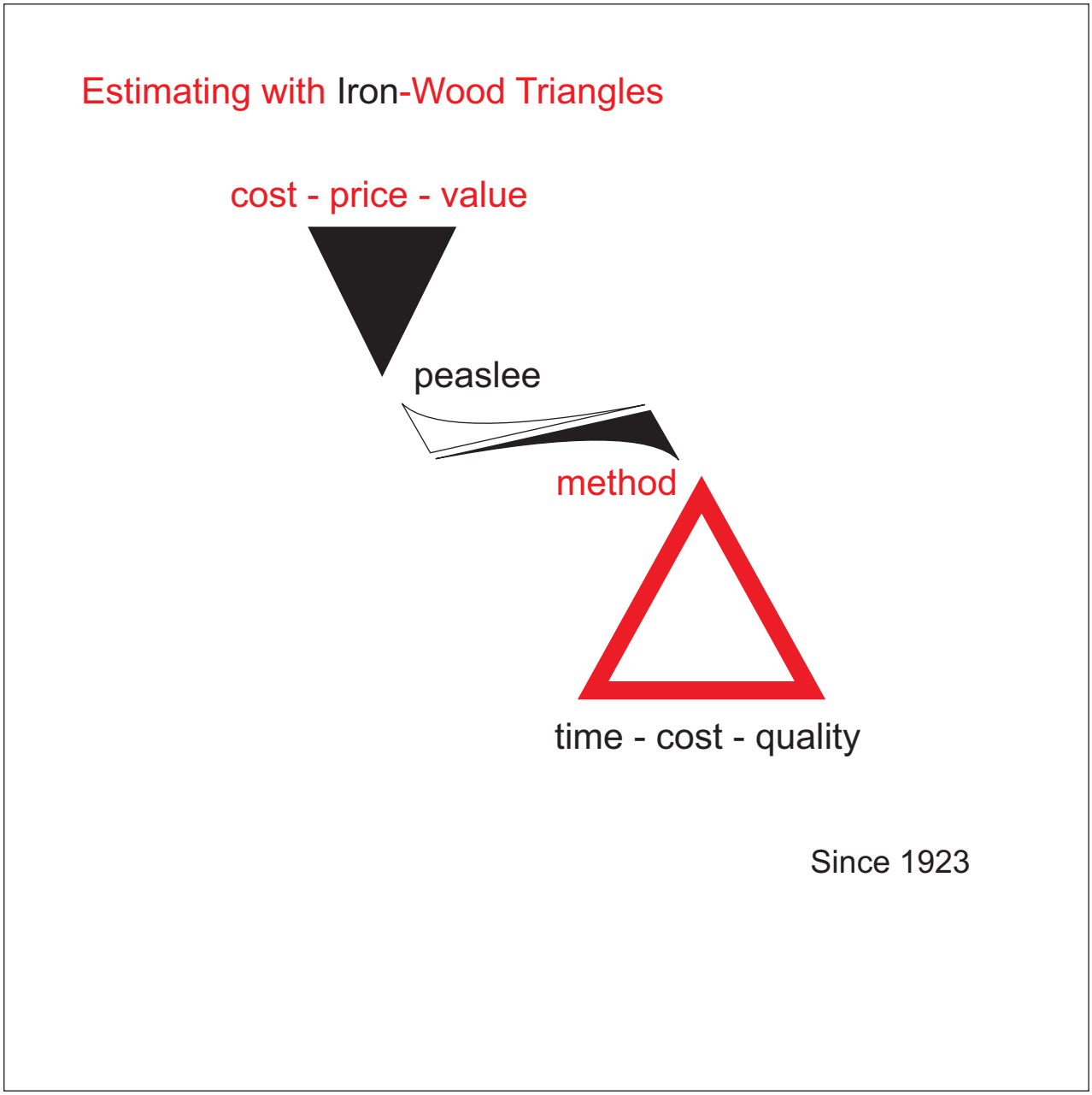
$2Mil +: allow 500 - 2100 hrs, $100,000 to $500,000, 6 to 12 months

There's an old saying that 90% of construction projects go over budget and schedule, not easy to substantiate but it bears discussing some of the possible causes and reasons. A rough estimate used to be the initial term that allowed for undefined margins of error.
It may be known today as a Rough Order of Magnitude, that recognizes the widest of margins, possibilities ranging from minus to plus 50%. This occurs also as conceptual or "square foot costs', and very little time is invested here with undeveloped drawings and specifications.

At 39th & Lexington in Midtown Manhattan, our client's neighbor, building a 33 story hi-rise, we supervised the underpinning of client's 5 story office building in 2015 with the guidance of same engineering firm for the World Trade Center, MRCE.

This is an opportunity to collaborate with a combination of efforts, research and information gathered and produced in team efforts lead by the architect who must define the client's objectives for the project and with the builder that can confirm the parameters at the earliest stages, what the realistic possibilities are. The relevant issues and considerations can be grouped in 3 categories, with understanding that any change will have impact on the others.

As things progress with more determinations and information made available, the margins can be reduced to -10 to +25%. In pursuit of accuracy, this would be known as a detailed



estimate, that relies on development and elaboration of the drawings as well. At this point, it is ideal to introduce a parallel effort as a means of verifying accuracies in process. The first two stages mentioned are sometimes known as ‘top-down’ estimates and carry increased margins, it’s here we simply suggest there be a contingency budget which we’ll address later. It is useful to use empirical data from completed work of a similar type from in-house or external references, (or case studies). Accuracy is still the priority and this requires the conventional ‘bottom-up’ approach which employs several techniques with software unit-cost methods that rely on quantity take-offs from completed drawings and specifications produced in BIM and CM software programs. A competent estimator will extract and be able to work with the material amounts, but also to determine the labor/hours to install, fabricate or finish the work. This is also a function of crews and their skill levels as well as familiarities with the work types.

There is a link between art & science that estimators must develop into heightened skills as distinguished by a combination of anticipation, pessimism and foresight. It may be called judgment as well, but remember that 90% adage?, it is not without merit. It has been around for as long as mankind has been building.

It’s an interesting characteristic often excluded in discussions with the ‘Triangles’ topics. These topics are introduced at the earliest stages, when budgets and schedules are less clear and in this diagraming phase. Changes are inevitable and they are inextricably linked, one ripple automatically sends a tsunami wave to the other two parts, (Surf’s up)!

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South Windsor, CT Town Hall
photo: Stuart D. Peaslee
1971 (in high school)

As architects engineers and builders make the buildings, there is a concern to keep going, to sustain the business and get on with the Next project. Hence, the margins rule is as dictated by the bottom line and the competitive landscape, as is by the client's budget. Therefore, if the estimates exceed the client's budget for the project, it won't proceed as planned and will need to re-design or be abandoned. The estimating process is then integral to success even before breaking ground.

These Iron-Wood Triangles in the diagram represent the 'top-down - bottom-up' assigned topics and deserve extra attention due to their distinction between Quality and Value. Price, Cost and Time, (P,C,T), are usually systematic whereas Quality and Value, (Q, V) require greater identification and definition for clarity, and accuracy. P-C-T would benefit from the pessimism, (as another adage tells us that if we plan on one hour for a given task it likely will take two and a half, minimum, particularly if not done often).

Defining the acceptable margins and the character of the work considers aesthetics, location, logistics, construction types, durability, convenience and anticipation of obstructions and obstacles. At this point, we can start the process of a safe estimate for the work to be considered.

A foundation for the Avery Extension to the Wadsworth Atheneum in Hartford, CT being excavated in 1933 and completed. A.F.Peaslee, Inc.

Eliminate unknowns and uncertainty?, not a chance of it, but we can minimize the risks. Imagine the traits of Fred Astaire and Red Adaire as essential elements to those of the best, or ideal estimator. One, with skill and adept choreography to navigate the uncharted waters, the other, to predict the worst and deliver the best solutions in the perfect storms. Aside from the premium characters, in this discussion what form would this effort become?

In Estimating I, we mentioned 'cutting the suit to fit the clothe' technique, and we can do this more precisely with Contract pricing which is based on fully developed drawings and specifications, the quality of which makes our estimating accuracy feasible. It is the most time consuming of the three phases, yet it will aim for margins closer to within 10%.

Detailed Costs are time consuming because they require Task analysis and Quantity Take-offs that depend on the quality of the detail drawings and developed specifications.
Here is a list of foreseeable obstacles to be aware of in pre-construction phases:

trade coordination

vendor/supplier coordination

overruns causes such as:

calculation errors, mistakes

vague or incomplete details & spec.'s

estimator inexperience

project types; (novel, small)

locations - unfamiliar

logistics

unforeseen conditions

changes in scope - client requests

recordkeeping

A foundation for a residence being excavated in 1923 in West Hartford, CT. A.F. Peaslee, Inc.

The two project types that bear close attention are small projects because of their economy of scale factor and those with a novel design character. Small jobs are inefficient and novel work demands familiarity which may add significant costs in procurement of appropriate trades or craftsmanship and materials.

In summary, the Concept / Detail / Contract process consist of ‘top-down’ and “bottom-up’ approaches typically. The optimal methods and procedures would be enhanced and augmented with an informal process based on empirical reference and knowledge based on experience. In addition, a ‘cross-check’ would be of super-benefit if done by a competent third party entity acting objectively, such as a project manager instead of an estimator.

Finally, upon a project’s completion, review the bid set and compare it with actual costs in a spread sheet analysis. Note the problems to avoid in the future. As mentioned earlier the added possibility of contingencies built into the total costs, with the small or novel projects.

Unless buildings are made in an assembly line process, ‘ad hoc’ will always exist in a project.

The task for managing C-P-V and T-C-Q well, is as follows: top-down, bottom-up, cross-check and definitively, with foresight of iron-wood.

Minimize the Risks. Well-planned is half done.

...and the first home built by A.F. Peaslee, Inc. located in Farmington, CT. 1923

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citations

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“Somebody gets into trouble and then gets out of it again. People love that story. They never get tired of it.” *- Kurt Vonnegut*

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in our process... the values of Time
are in your returns

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