



Forecasting Strategies

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What is a 'Forecast'?

Forecasting is part of every business. We need to track our financial performance and predict the profit outcome. On a construction project, a forecast would generally comprise two parts – A cost forecast and a revenue forecast.

I define a cost 'forecast' as a project person's assessment (at a specific point in time) of the most likely total cost of the project at project completion.

Similarly, a revenue forecast attempts to estimate the total revenue that the construction enterprise will generate on the project.

Once we have the forecast total project cost and forecast project revenue, we are in a position to forecast the project margin (profit) at completion.

We should carry out this exercise regularly (monthly) and we should track the differences between each forecast as we go. This will highlight any trends, and allow corrective action to be taken if required.

If we only forecast say quarterly, then we leave ourselves little opportunity to identify issues and take evasive action. After three months 'the horse has bolted'!

Strategy

From the beginning of the project, users should attempt to forecast the completed cost of the project, ie. use their best endeavours and judgement each month to produce a forecast (cost and revenue) which then gives the anticipated profit at completion, 12 months or more into the future.

Cost Reference Structure

Before we discuss the actual forecasting methodology, we need to discuss the cost reference structure for the project. The cost reference structure (work breakdown structure) on most construction projects is usually setup to include an item for each trade package along with a set of preliminaries items. The structure needs to be sufficiently detailed to allow us to work on appropriately sized components suitable for pricing, but no more detail than that. For example, if we have a brickwork subcontract, we would generally forecast at the trade package level. There is generally little point in breaking the cost reference structure into more detail than just the trade package. Within the trade of course, we may well have more detail, in the form of the contract payment schedule, but this detail is not generally required at the cost references level.

In the Cheops system, it is possible to spread a subcontract over many cost references. – but is this a good idea? My experience is that users are very prone to making mistakes when subcontracts are allocated across multiple cost references. It is difficult for the human brain to keep track when costs for a single trade are allocated in multiple places. My recommendation is one cost reference = one trade package, and vice-versa.

If the trade package includes scope of work from several cost references, then I recommend using budget transfers to move the budget to the single cost reference for the trade package.

This 'single cost reference' allocation then requires that head contract and subcontract variations relating to the trade package should be allocated to the same trade package cost reference. We will then have all of our costs and all of our revenue on the one cost reference, and forecasting will be simple.

'Estimated Final Cost' or 'Anticipated to Complete' method?

In my experience, approx. 50% of construction companies use 'Estimated Final Cost', and 50% use 'Anticipated to Complete'.

The **Estimated Final Cost** method, is where the user is asked to enter a full forecast for every cost that will be encountered on each cost reference, regardless of what has been committed (orders and contracts, etc.). The forecast is the full value of anticipated spending on that trade. Therefore, at project completion, the actual cost should be equal to the last forecast, for each cost reference.

The **Anticipated to Complete** method, is where the user is asked to enter a forecast for any items not yet committed. The system shows the current committed cost for each cost reference (and this is already included in the forecast), and the user considers what else needs to be spent on each cost reference. The estimated final cost is thus equal to the current committed cost plus the anticipated to complete value.

A discussion of which method is best will take more space than is appropriate for this paper. Suffice to say that each has its pros and cons. Please refer to the "**Forecasting Anticipated to Complete or Estimated Final Cost**" paper.

What are our aims?

So what are we trying to do with forecasting?

Most company managers have difficulty in coping with forecasts which vary widely from month to month. A trade that is let below budget this month may generate additional profit only to find that profit consumed in the following month by another trade letting in excess of its budget.

From month to month, the total forecast margin should ideally reflect a consistent profit outcome (potentially equal to the original margin at contract signing), ie. not up and down with the large swings mentioned above. In order to balance trade lettings under and/or over budget, we will most likely need a 'contingency' to take up the differences.

If necessary we may decide to use this contingency to balance any subcontract lettings which differ from the package budgets. Of course, we will need to show where profits and losses have occurred. If there are no contingencies, then we are forced to show a loss.

Company management will generally give direction regarding release of contingency, although if contingencies are in excess of likely requirements, they may be progressively released.

Forecast Both Revenue and Cost

When forecasting is discussed, the emphasis is often solely placed on forecasting cost. It is equally important to forecast revenue. The forecasting of revenue relates to the revenue side of the head contract variations.

When head contract variations are approved, *Cheops* will update the project revenue (a system parameter controls this). But we must also consider the likely revenue for head contract variations which we expect to be approved (and we have forecast the resultant cost), but as yet they remain unapproved.

We need to consider taking up some '**anticipated revenue**' for these variations (to balance or offset our cost forecast), and this is discussed later in this paper.

Managing Change

So we have setup our forecast and now our job is to update the forecast immediately that we encounter any impacts. These impacts may be caused by any of the following:

- Subcontract lettings
- Subcontract variations
- Head contract variations.
- Changes and/or delays to program.
- Changes to construction methodology which have cost implications.
- Project staffing changes
- Any other information which comes to light, and may have potential to affect cost and/or revenue.

The skill of forecasting is not 'crystal ball gazing' but it is to pay diligent attention to the task. Stay on top of the forecasting process during your daily work, and do not leave the forecasting until the monthly report is due. As each transaction is entered, update the forecast immediately.

The Forecasting Process

3.3 At project commencement, re-price the Preliminaries.

Once the project is underway, you will have firm knowledge of the staffing and duration, etc. Sometimes projects are awarded a considerable time after the original tender. It is likely that the staffing of the team (site and project management) may have changed from what was originally estimated.

When producing the first forecast for a new project, users should forecast the entire 'Preliminaries' trade section, based on the actual staffing and programmed construction time. This will immediately flush-out an issues and allow time to take any corrective action. Tell us any bad news early and we may be able to minimise the effects.

For time-based items (our labour, sheds, etc.), use the *Cheops* calculation fields and enter the 'from' and 'to' dates, and the system will display the number of weeks involved. Enter the quantity number for the item and the rate per week (or other unit). The system will display the total. (See example)

3.4 Head Contract Variations.

We need to consider several categories of head contract variations, as follows:

- a) Approved Variations
- b) Submitted Variation
- c) Estimated Variations

We may have cases where we have submitted head contract variations (or some not yet even submitted) where we may have incurred costs or we are expecting a costs, and we have correctly allowed for these costs in our cost forecast. Our margin will suffer unless we take up some value for revenue, and this is discussed below.

'Approved' Variations:

Head contract variations are generally set (by a system parameter) to update the *Cheops* budget (revenue) when the variations are 'approved'. They will report in the 'Approved Variations' column of various cost reports, and will be included in the "Revised Budget" column.

Include in the forecast final cost for carrying out approved head contract variations.

'Estimated and Submitted' Variations:

These variations shall be entered into the *Cheops* variation register and statused correctly as 'submitted' or 'approved' for tracking purposes.

These variations will report in the various cost reports, depending on the chosen report and format

If we are incurring costs for unapproved head contract variations, then as mentioned above, it is **mandatory** that we include these costs in our forecast. It is only by including the cost of all work in progress that we get an accurate assessment of the final cost of the project. and to balance the costs, we must also include some assumption of revenue. After all, we do expect we will ultimately achieve some approved value for our variation claim.

We account for this expected revenue, by entering '**anticipated revenue**' for the variation. We may discount our anticipated revenue by entering a lesser or 'safer' value form our actual claim.

When reading the various reports, we will all be aware that in order to achieve the 'Revised Budget' (our forecast revenue), we must gain approval of the amounts shown as anticipated revenue. This represents the value of the risk to the company of carrying out work for which we have no current approval.

3.5 Budget Transfers.

Budget transfers should be used only under certain circumstances and used with caution. Transfers may be used to move budgets where the content of a trade package to be let, is different from that previously planned by the estimator. That is, move the budget to where the scope of work now exists.

Some examples:-

- Site paving originally allowed in 'Landscaping' is now to be included in the 'Concretor' package. (Transfer the concrete component from the landscaping package to the concrete package)
- Bored piers which were estimated as a single package, are now to be bored by one subcontractor and the concrete placed by the 'Concretor'. (Transfer the concrete component from the piers package to the concrete package)
- Items previously allowed to be painted are now to be installed pre-finished. (Transfer the paint budget to the subcontract package)
- A single package, say Gyprock, is now to be split over two subcontractors. (Create a new cost reference for the second subcontract, and transfer the appropriate budget)

Budget transfers should generally **not** be used to adjust the 'variance' (difference between budget and forecast final cost). This masks the true outcome and is not helpful, particularly to estimators who require feedback as to the accuracy of their pricing. Any budget transfers made for other purposes, such as disguising true variances, would generally be regarded by management as a serious breach of trust.

3.6 The Forecast Entry.

The project manager / administrator shall enter forecast notes (with calculations if applicable) for each cost reference to describe the anticipated final cost outcome for the particular cost reference.

These notes and/or calculations shall be updated/amended each month to take account of changes in the cost structure as these changes occur, and to include future cost effects where they can be anticipated or foreseen.

1. At project commencement, the team will consider the work packages required, and the administrator will setup the project budget by entering the budgets for the individual cost references. Note that the Cost Report has some prerequisites regarding cost reference coding.
2. The budget for each trade item (as received from or otherwise agreed with the estimator) is generally the best information available at commencement, and this is used to begin the forecasting process. Once entered, the project budget may be then locked, and this locking process can write the budget into the first line of forecast notes for each cost reference. At this point, the forecast for each cost reference is therefore equal to the budget, and the variance (profit or loss for the item) is nil.

3. As each trade is let, the forecast is updated to reflect the let contract value, and further notes are added to allow for any additional scope items, not included in the let contract sum.

Subsequent lines of forecast notes are entered to forecast any other items of expense which are not included in the let contract value, or expenses which are likely to occur subsequently, based on the knowledge, experience and judgement of the project manager and administrator.

It is prudent to also provide an allowance for any potential subcontract variations which may not be recoverable from the client.

4. One or more allowances may be added as the last line(s) of forecast notes where there is a real and legitimate reason for such allowances (including a potential dispute). These allowances should not to be added as a means of hiding future profit. Such allowances shall be progressively reduced as the trade nears finalisation, and the requirement for the allowance is reduced or eliminated.

It is preferable not to refer to these in the forecast notes as “contingency”. Refer to them as ‘allowance for #####’, or ‘allowance for future subcontract variations’, etc. Be realistic, but do not hide budget for no reason.

5. If the trade letting plus other forecast allowances results in a worthwhile letting gain, and the team does not wish to release this gain to profit at this stage (which should be normal practice), then an item may be entered into the forecast notes for a contingency cost reference to take up the amount as a forecast cost. This will result in the saving being shown against the trade package concerned (reflecting the true position) and the equivalent cost entered against the contingency, effectively taking back the saving and leaving the total margin for the project unchanged.

This then builds a set of trade contingencies, all against the one cost ref., where the total can be identified by management. These trade contingencies may be automatically included in the contingencies section of the cost report summary.

The affect is that the margin is maintained as it was previously, and the contingency is declared separately.

6. If a trade is let at a loss, this loss together with any additional items and allowances required (which add to the loss) should be forecast and reflected in the variance for the code. (Applies equally to prelims). That is, tell all the bad news, and do not 'dribble' the bad news progressively over the coming months. If possible, cover the loss on the trade, by releasing an equivalent amount from the contingency code. If the current contingency is inadequate to cover the loss, then consider the possibility of entering favourable forecasts for one or more trades that are currently unlet (see item 10. below).
7. For Schedule of Rates subcontracts, the contract shall be setup in *Cheops* with budget quantities and contract rates, resulting in a calculated theoretical contract sum. (This is the sum which must be entered into the contract documents).
8. The forecast for the 'preliminaries' items will comprise lines of notes and calculations to predict the outcome of these items also. As the project progresses to completion, these items may be forecast by adding an amount 'still to expend' to the actual cost to date.
9. From the letting of the first trade package, the forecast report will show a variance (profit or loss on the item) which will reflect in an adjusted profit for the project.
10. When trades are let with large variances (plus or minus) these should still to be entered in the forecast notes in the above manner as and when they occur. The forecast should **not** to be withheld in anticipation of making savings or losses on trades which are still to be let. If there is potential (based on real knowledge and/or experience) for the item to be balanced as later trades are let, then these items should be entered as forecasts also – even though currently unlet. If there is no real basis for anticipating that the item will be balanced in the future, it is essential to declare the situation to management as early as possible.
11. Subcontract variations may be added to the forecast notes for the respective cost references by the system automatically (system setting) when they are approved.
12. The project manager / administrator should check that the appropriate accounts department postings (wages & salaries, journals, recharges, etc.) have been entered each month and that he/she is aware of these entries and has made the appropriate allowances in the forecast.
Note that it is the responsibility of the project team to advise the accounts dept. of the various cost references where these charges are to be allocated.

Examples of Forecast Entries**1. Start of Project:**

At the start of a project, we generally have little specific knowledge on which to base our forecast. The most likely option is simply to use the budget for the cost reference as the forecast. Obviously, if we do not have knowledge about the trade (no trade tenders received, etc.), then we will use the latest information and this is likely to be the budget.

| | | |
|---|-----------------|-------------------|
| F | Original Budget | 123,456.00 |
| | Total | 123,456.00 |

Variance = 0.00

2. Preliminaries:

For example – Project Manager

| | | From | To | Wks | Qty | Rate | Amount |
|---|----------------------------|-----------|-----------|-----|-----|--------------|------------------|
| F | Original Budget (\$79,000) | | | | | | 0.00 |
| F | Billy Manager | 01 APR 14 | 01 NOV 14 | 31 | 1 | 2,600.00 | 80,600.00 |
| | | | | | | Total | 80,600.00 |

Variance = (1,600.00)

3. As Trades are Committed:

| | | |
|---|---|-------------------|
| F | Original Budget (\$ 123,456.00) | 0.00 |
| F | Contract let to ABC Contracting | 101,234.00 |
| T | Allowance for additional widgets, not included in subcontract | 9,876.00 |
| T | Allowance for day labour, etc. | 12,346.00 |
| | | |
| | Total | 123,456.00 |

Variance = 0.00

4. Forecast Builds Up Progressively:

| | | |
|---|--|-------------------|
| F | Original Budget (\$ 123,456.00) | 0.00 |
| F | Contract let to XYZ Contracting | 101,234.00 |
| F | SCV*XYZ.01 - Modifications to whatnots | 2,234.00 |
| F | SCV*XYZ.02 - Additional widgets, not included in subcontract | 4,500.00 |
| T | Allowance for day labour | 8,500.00 |
| | | |
| | Total | 116,468.00 |

Variance = 6,988.00

(Resulting in \$6,988 released to profit)

5. Contingencies:

| | | |
|---|--|------------------|
| C | Concrete contingency | 5,500.00 |
| C | Formwork contingency | 7,000.00 |
| C | Roofing contingency | 8,300.00 |
| C | Hydraulics contingency | 29,000.00 |
| C | Part contingency released to cover loss on Windows letting | -15,000.00 |
| | | |
| | Total | 34,800.00 |

Note that the effect of the above single contingency code is to show the full saving at the respective trade codes (having the effect of releasing the amounts to profit), and then forecasting an equivalent cost against the single contingency code (which takes up the amount as a forecast expense).

Showing the correct trade outcome gives the correct feedback to estimators and company management, and the contingencies 'trade' adjusts the overall cost (and therefore margin) to show a conservative margin). Company management is also aware of the contingency and knows that the declared margin is protected by the contingency. The amount of comfort depends on the amount of contingency.