

PROJECTIONS, BUDGET, AND CONTINGENCIES

Project management goes hand in hand with risk analysis. Furthermore, there are numerous methods to manage project costs, just as there are many cost variations in the construction industry. Whatever the preferred method is, it is important to keep tabs on projects and their budgets during the progress of the construction work. To this effect, here are the various methods suggested by Maestro and possible with the data generated by the software.

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REMINDER - BASIC CONCEPTS

What is a Budget?

In the context applicable to **maestro***, a budget can be defined as the sum of incomes and the sum of foreseen expenses for the realization of a project. A cost budget refers to a budget monitored by the project manager, for example, and usually consists of an amount that results in the sum of expenses / project costs; this is equivalent to a quotation from which profit is subtracted. There is also the sales budget, which consists of the sum of revenues generated by the project; it is equivalent to a quotation. Finally, a revised budget consists of using the original budget to which changes were made. These budget revisions can be internal (i.e., when a mistake is found in a quotation) or external (i.e., if a customer asks to make changes to the initial quotation).

A budget can also refer to quantities, the latter being decisive in the calculation of the former. It should be noted that unit costs are based on actual and produced quantities, where applicable. Quantities are also used for the calculation of projections.

What is a Projection?

A projection is a new total amount budgeted according to actual data accumulated up to a specific date, plus all future budgeted items. A projection in no way replaces a budget; it is distinct and additional information. In the context of a project, a projection is established when the former is in progress. It is therefore necessary to cumulate the data from the work already done and add what remains to be done.

What is a Contingency?

A contingency refers to a provision for unforeseen events. It is directly linked to the projection, since it is a future estimate of unexpected expenses to come. In short, a contingency is a cost provision, the exact details of which are not clearly defined, that is added to the actual and incurred costs to make a projection. This is the case, for example, when a project manager knows that unforeseen and additional costs will have to be borne by the company following the discovery of mould in walls, even though the extent of the problem has not yet been assessed and no estimate has yet been received¹.

A contingency can therefore be defined as a likely estimate of the data that allows us to make a projection. More precisely, a contingency allows to reevaluate the progress costs of a project using estimated values, without having any accounting repercussions and staying as close to reality as possible. Even if

¹ Even though the present explanation a contingency refers to actual and committed costs, contingencies also exist for incomes. Furthermore, a contingency could be linked to a reduction of the planned costs. This could be the case, for example, if the construction work is done quicker than anticipated and finished before the predetermined end date, therefore reducing the costs.



contingencies generally appear during construction work, they can sometimes be known before the project even begins, particularly if there are uncertainties in some elements of the quotation. In a way, these are amounts set aside for exigencies, unforeseen but statistically predictable increases in costs. A contingency therefore allows for adjustments to be made during the construction process in order to give a more accurate idea of the future costs, and thus get closer to the projected costs.

It is important to remember that using contingencies in **maestro*** and in the context of calculating projections does not generate any financial transactions. The purpose of contingencies is simply to help calculate projections since, during this calculation, it is required to identify the values entered in contingencies. Projections are therefore manual and managed by users. The values are taken as is, without any processing.

In **maestro***, we can find the notions of contingencies and advanced contingencies, which refer to two options available in the software to calculate the projection (final cost) of a project; the first is a manual adjustment and the second automatically calculates the missing values from the data provided. However, values entered as contingencies replace previous ones; they are not added. It is therefore always necessary to enter the final value desired, unlike most other functionalities in **maestro***.



Other than the projection calculation, and because they do not generate any accounting entries, contingencies in **maestro*** are used for many things by users. For more information on this subject, please read the document to this effect.

PROJECTION METHODS IN MAESTRO*

In **maestro***, there are a dozen methods available to the user to calculate the final cost (projection) of a project while it is in progress. Some of these methods allow for the follow up of unit costs (most specific to civil engineering or specialist companies) and/or the follow up of lump sums. The method can be selected in the project itself (allowing for an appropriate projection method to be used for the project) or by project types (if project types have been set).

The Contingency Method (Advanced or Not)

While the term contingency refers to risk planning and a means to deal with unforeseen situations, in **maestro*** it is actually an amount or quantity that is added to a project, by activity or by group. This amount or quantity is then used to perform calculations and make a projection for the project.

The basic contingency method requires monthly input of contingencies (either amounts or quantities) so that **maestro*** can then calculate a projection for that project. In short, the user has a window where a grid is displayed, detailing the activities and groups, and where they can select the project. Contingencies need to be entered in this grid, either as an amount or quantity. The latter also displays the actual quantities and amounts and those of the current month. This way, the user can, on a regular basis, determine the quantity and/or amount per phase and/or per activity related to the work to be carried out in order to complete the project without these

quantities and/or amounts being accounted for. Note that these contingencies can be imported through an *Excel* file.



Please note that it is not possible to track the history of contingencies entered over time in **maestro***.

Maestro* also provides users with an option, called **Advanced Contingencies**, which has the advantage of automatically recalculating values when costs are added to the project, and display them in the grid. The advanced contingency programme estimates the costs required to complete the work based on actual costs, incurred costs, and contingencies. The amounts are compared to the budget, indicating whether a cost overrun is to be expected. Finally, it should be noted that this method is mainly used for unit project costs.



Contingencies entered in the **Advanced Contingencies** option are then transferred to the **Contingencies** option.

Also, **maestro***'s **Project Inquiry**, **Project Pivotal Analysis**, and **Miscellaneous Reports** options allow to display these contingencies and projections to make analyses.



Pivotal View

The pivotal view can be compared to an *Excel* pivotal table. Unlike data on a report, which is static, the data in a pivotal analysis can be grouped according to various table categories (columns and fields) and the necessary operations can be performed on the corresponding amounts.

The Budget Method

The budget method simply asks of a user to look at the projects to analyze whether the committed costs are greater or less than those planned, and if the financial projections still correspond to the initial budget. That way, if the actual costs plus the committed costs equal less than the initial budget, the projection equals the budget. If, however, the actual costs plus the committed costs equal more than the initial budget, the projection then equals the sum of the real and committed costs.



Committed Costs (to calculate projections)

Committed costs in **maestro*** refer to project expenses to which the company has already committed itself: orders, stock orders from catalogue, subcontracts, etc.

The Linear Methods

To calculate a projection, the various linear methods consist of determining a unit cost for the produced quantities and applying this cost to the remaining quantities to be received to complete the project.

Linear Method with Actual Unit Costs - By Group

Making a projection with this method simply asks that you multiply the actual unit cost, on the reevaluation date, by the planned quantity (budgeted). However, if the actual quantity is greater than the planned one (budgeted), it is the actual quantity that is used to calculate the projection.

Scenario 1a)

Example of Data Available in maestro*

Activity	Description	Budget (\$)	Budget (qty)	Actual Costs	Actual Quantities	Committed Costs	Projection
B2030	Outside doors	\$2,500	5	\$1,800	2		\$4,500

$$\begin{aligned} \text{Projection} &= \text{Actual Unit Cost} \times \text{Planned Quantity (Budgeted)} \\ \$4,500 &= (\$1,800 / 2) \times 5 \\ \$4,500 &= \$900 \times 5 \end{aligned}$$

Scenario 1b)

Example of Data Available in maestro*

Activity	Description	Budget (\$)	Budget (qty)	Actual Costs	Actual Quantities	Committed Costs	Projection
B2030	Outside Doors	\$2,500	5	\$4,000	6		\$4,000

If the actual quantity is greater than the planned quantity (budgeted)

$$\begin{aligned} \text{Projection} &= \text{Actual Unit Cost} \times \text{Actual Quantity} \\ \$4,000 &= (\$4,000 / 6) \times 6 \\ \$4,000 &= \$666.67 \times 6 \end{aligned}$$

Linear Method with Pessimistic Unit Costs - By Group

This projection method is based off the comparison of the planned unit cost (budgeted) to the real unit cost. If the actual unit cost is greater than the planned unit cost (budgeted), then it is the actual unit cost that is multiplied by the planned quantity (budgeted). If, however, the actual unit cost is less than the planned one, it is the planned unit cost (budgeted) that will be multiplied by the planned quantity (budgeted). And in order to get a glimpse of the worst case scenario, the planned quantity (budgeted) is replaced by the actual quantity, if the latter is greater.

Scenario 2a)

Example of Data Available in maestro*

Activity	Description	Budget (\$)	Budget (qty)	Actual Costs	Actual Quantities	Committed Costs	Projection
B2030	Outside Doors	\$2,500	5	\$1,800	2		\$4,500

Comparing the Planned Unit Cost (Budgeted) vs the Actual Unit Cost
 (\$2,500 / 5) vs (\$1,800 / 2)
 \$500 vs \$900

Projection = Highest Unit Cost x Planned Quantity (Budgeted)
 \$4,500 = \$900 x 5

Scenario 2b)

Example of Data Available in maestro*

Activity	Description	Budget (\$)	Budget (qty)	Actual Costs	Actual Quantities	Committed Costs	Projection
B2030	Outside Doors	\$2,500	5	\$2,600	6		\$3,000

If the actual quantity is greater than the planned quantity (budgeted).

Comparing the Planned Unit Cost (Budgeted) vs the Actual Unit Cost
 (\$2,500 / 5) vs (\$2,600 / 6)
 \$500 vs \$433.34

Projection = Highest Unit Cost x Actual Quantity
 \$3,000 = \$500 x 6

Linear Method with Optimistic Unit Costs - By Group

This projection method is also based on the comparison of the planned unit cost (budgeted) to the actual unit cost.

To perform the necessary calculations of the linear projection method with optimistic unit cost, it is mandatory to use the highest unit price (between the actual unit cost and the planned unit cost (budgeted)) and to multiply it

by the remaining quantity to be received (the planned quantity minus the quantity received to date). To this must be added the sum of expenses to date for the acquired quantity.

Scenario 3

Example of Data Available in maestro*

Activity	Description	Budget (\$)	Budget (qty)	Actual Cost	Actual Quantities	Committed Costs	Projection
B2030	Outside Doors	\$2,500	5	\$1,800	2		\$4,500

Comparing the Planned Unit Cost (Budgeted) vs the Actual Unit Cost
 (\$2,500 / 5) vs (\$1,800 / 2)
 \$500 vs \$900

Projection = (Highest Unit Cost x Remaining Quantity to be Received) + Actual Costs
 \$4,500 = (\$900 x (5 - 2)) + \$1,800
 \$4,500 = (\$900 x 3) + \$1,800
 \$4,500 = \$2,700 + \$1,800



The three methods that follow, the activity-based methods, are identical to the group-based methods, with the only exception that the planned quantities (budgeted) correspond to the quantities to be received and the actual quantities come from the **maestro* Production** option.

Linear Method with Actual Unit Costs - By Activity

Making a projection using this method simply consists of multiplying, for the activity, the actual unit cost by the quantity to be produced. However, if the actual quantity, which comes from the **Production**, is greater than the quantity to be produced, the actual quantity is used to calculate the projection.

Linear Method with Pessimistic Unit Costs - By Activity

This projection method is based on the comparison of the planned unit price (budgeted) to the actual unit cost. If the actual unit cost is higher than the planned unit cost (budgeted), the actual unit cost is multiplied by the quantity to be produced. Otherwise, if the actual unit cost is less than the planned one, the planned unit cost (budgeted) will be multiplied by the quantity to be produced. And in order to get a glimpse of the worst case scenario, the quantity to be produced is replaced by the quantity in the **Production** option, if it happens to be greater than the former. In sum, this scenario suggests the use of the higher unit cost and the greatest quantity to calculate the projection.

Linear Method with Optimistic Unit Costs - By Activity

This projection method is based on the comparison of the planned unit cost (budgeted) to the actual unit cost.

To perform the necessary calculations of the linear projection method with optimistic unit cost, it is mandatory to use the highest unit price (between the actual unit cost and the planned unit cost (budgeted)) and to multiply it by the remaining quantity to be produced (the planned quantity minus the quantity received to date). To this must be added the sum of expenses to date for the received quantity.

Progress Percentage Method - Addition of Delays/Gains

This projection method calls upon the progress percentage entered by the user in the **Project Progress** option to calculate the loss or gain.

The calculation's formula is the following:

$$\text{Projection} = \text{Total Amount Planned (Budgeted)} + \text{Actual Expenses} - (\text{Progress \%} \times \text{Total Amount Planned (Budgeted)})$$

Scenario 4

Example of Data Available in maestro*

Activity	Description	Budget (\$)	Budget (qty)	Actual Costs	Actual Quantities	Progress %	Projection
C1010	Internal Partitions	\$15,000		\$350		10%	\$13,850

Projection	=	Total Amount Planned (Budgeted)	+	Actual Expenses	-	(Progress %	x	Total Amount Planned (Budgeted))
\$13,850	=	\$15,000	+	\$350	-	(0.1	x	\$15,000)
\$13,850	=	\$15,000	+	\$350	-			\$1,500

Progress Percentage Method - Expense Rate

This method involves dividing the real expenses by the work progress percentage, i.e. :

$$\text{Projection} = \text{Actual Costs} / \text{Progress \%}$$



If most of the expenses are made at the beginning of the project, rather than as the goes on, this can lead to a disproportionate projection.

Scenario 5

Example of Data Available in maestro*

Activity	Description	Budget (\$)	Budget (qty)	Actual Costs	Actual Quantities	Progress %	Projection
C1010	Interior Partitions	\$15,000		\$1,300		5%	\$26,000

$$\begin{aligned} \text{Projection} &= \text{Actual Costs} & / & \text{Progress \%} \\ \$26,000 &= \$1,300 & / & 0.05 \end{aligned}$$

SUMMARY OF THE DIFFERENT METHODS

Method	Characteristics
The Contingency Method (Advanced or Not)	Requires a monthly input of contingencies (either amounts or quantities) so that maestro* can then calculate a projection for that project.
The Budget Method	Is the comparison between actual and budgeted costs.
Linear Methods	
By Group	Linear Method with Actual Unit Costs - By Group Calculation based on the use of the actual unit cost.
	Linear Method with Pessimistic Unit Costs - By Group Calculation based on the use of the highest unit cost (between the budgeted and actual cost) and the greatest quantity (between the planned and actual quantity).
	Linear Method with Optimistic Unit Costs - By Group Calculation made using the highest unit cost, the remaining quantity to be received, and the already committed costs.
By Activity	Linear Method with Actual Unit Costs - By Activity The linear methods by activity are quite similar to the linear methods by

Method	Characteristics
	group, with the difference that the planned quantities (budgeted) correspond to the quantities to be received and the actual quantities come from the maestro*Production option.
	Linear Method with Pessimistic Unit Costs - By Activity
	Linear Method with Optimistic Unit Costs - By Activity
Progress Percentage Methods	
Progress Percentage Method - Addition of Delays/Gains	Calculation which takes into account the total budgeted amount, the progress percentage, and the actual expenses.
Progress Percentage Method - Spending Rate	Calculation based on the actual expenses and the progress percentage.


 **Maestro*** allows to see at a glance the summary results of each of the PAG (project-activity-group) projection calculation methods in the **Project Inquiry** option.

Tableau comparatif des projections

Projet: []
 Activité: []
 Groupe: []

Configurations de base
 Base de calcul budgétaire comprend...
 Réel

Information du projet
 Méthode de calcul des projections Contingences
 Niveau d'entrée du % d'avancement Projet / Activité
 Méthode de calcul des projections utilisée Contingences

Détail	Méthode de calcul des projections	Bud. Rév.		Réel		Contingence	Taux avancement	Projection	Détail du calcul
		Mnt	Qté	Mnt	Qté				
1	Contingences					0.00		0.00	
2	Budétaire	0.00	0.00						
3	Linéaire avec coût unitaire réel (par groupe)	0.00	0.00						
4	Linéaire avec coût unitaire pessimiste (par groupe)	0.00	0.00						
5	Linéaire avec coût unitaire optimiste (par groupe)	0.00	0.00						
6	Linéaire avec coût unitaire réel (par activité)	0.00	0.00						
7	Linéaire avec coût unitaire pessimiste (par activité)	0.00	0.00						
8	Linéaire avec coût unitaire optimiste (par activité)	0.00	0.00						
9	% Avancement - Ajouter retard/gain	0.00					0%	0.00	
10	% Avancement - Rythme de dépenses	0.00					0%	0.00	

- REMINDER**
- **Maestro*** allows the input of contingencies, either as amounts or quantities.
 - A dozen methods are offered to users in **maestro*** to calculate the final cost (projection) of a project when the latter is in progress.
 - Some methods use the actual unit cost, the highest unit cost, produced quantities, actual expenses, and/or progress percentages. Furthermore, the method can be selected in the project itself (allowing for an appropriate projection method to be used for the project) or by project type (if project types have

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been set).

- In the **Project Inquiry** option, a feature allows to view all projection types, as well as the generated results.

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