Project Progress

HELP.PSPRG

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SAP™

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Project Progress

Purpose

You use the planning phase of your project to plan how you want your project to progress. However, errors in planning or unforeseen events may cause the project to vary from the plan.

The project objective will then only be achieved if project management identifies these variances early on and takes prompt action to correct them. To this end, project management requires constant access to current information about:

- Project status

  The state of the project at a particular time, as derived from actual data on costs, dates, and capacities.

- Project progress

  The progress of the project towards achieving its goal, as of a particular time, compared with planning

- Expected project development

  How you expect your project do reach completion. If the actual course of the project varies from the plan at a particular point in time, you can use key dates and simultaneous schedule updates to forecast the project's further progress.

Neither costs, resources, nor dates may be viewed in isolation. You can only draw meaningful conclusions about the progress of your project when you can compare actual results with these values.

The Project System provides tools for effective project monitoring, control, and execution, as follows:

- Progress analysis

  Progress analysis is the tool you use to determine planned and actual project progress values, and to compare the two sets of data. This enables you to identify cost and schedule variances early and take appropriate action.

  For details, see Progress Analysis [Page 7]

- Milestone trend analysis

  This is an easy-to-use, effective process for monitoring your project schedule. To this end, the system evaluates the milestones relevant to project progress at different reporting times. In the graphical MTA chart you recognize trends and variances immediately.

  See: Milestone Trend Analysis (MTA) [Page 48]

- Cost forecast

  You can use this process to calculate the costs expected to occur between now and the end of the project, based on plan and actual values. The updated cost to complete calculation gives you a realistic forecast of the costs you can expect over the rest of the project. This method helps you decide whether and how to continue a project. The system calculates expected cost at completion (EAC) as well as the cost to complete (CTC).

Project Progress

See Project Cost Forecast [Ext.] .

Progress Analysis

Use

Progress analysis is the tool you use to determine planned and actual project progress values, and to compare the two sets of data. The system uses the overall planned costs to evaluate the work done, meaning that that evaluation is not dependent on the costs planned or posted by period. You can determine the relevant values at any time or as part of the period-end closing work that you plan in the Schedule Manager [Ext.].

You can evaluate progress analysis data using the standard reports provided for this purpose in the project information system. You also have the option of defining your own reports, which you can tailor precisely to your information needs.

See Evaluating Project Progress [Page 41] .

Progress analysis is best used on projects where:

- Time is critical
- You have planned a lot of work packages
- Processing is resource-intensive - for example, include time spent by developers working on an R&D project.
- Progress does not depend on the costs being incurred - that is, progress cannot be derived from the costs being incurred

You can implement progress analysis as follows:

- Internally, to identify schedule and cost variances promptly You can then take appropriate action.

  For example, capacity bottlenecks mean that your project is not keeping to schedule. However, costs are lower than expected. If it is now more important to keep to schedule than to keep to budget, the project management can enlarge the project team, which can then catch up.

- Externally, to supply the ordering party with the necessary reports on the execution of the project As the system generates the appropriate reports automatically, everyone involved in the project can keep track of its progress. Clear information and good communications thus become important factors in your project's success.

  If billing in your project takes place when a milestone is reached, progress analysis supports acceptance of the milestones. The data from the analysis documents the fact that the project team has achieved the milestone as agreed.

  You can use progress analysis as an objective measuring instrument, comparing the success of several projects.

Features

As your project progresses, you can use progress analysis to obtain answers to the following questions:

Question	Answered by	Description
How far should my project progress by a particular point in time?	Planned POC	The planned POC is the value of the work planned for up to a certain point in time, expressed as a percentage of all the work required. It is calculated using rules and based on the project data.
What is the value of the planned services?	BCWS [Ext.]	This is the value of the planned services, relating to a reference factor (planned costs or overall budget) for the overall value of the work to be done. It is calculated as follows: BCWS = Planned POC * overall costs
How far has my project actually progressed?	Actual percentage of completion (POC)	The POC is the value of the work actually done up to a certain point in time, expressed as a percentage of all the work required. It is calculated using rules and based on the project data.
What is the value of the actual work performed?	BCWP [Ext.]	This is the value of the services actually rendered in relation to a reference factor (planned costs or overall budget) for the overall value of the services. It is calculated as follows: BCWP = Actual POC * overall costs
What are the planned costs?	Accumulated planned costs or overall budget	The total value of the work to be carried out.
Which values act as the reference factor for the overall value of the work done?	Accumulated planned costs or overall budget	The total value of the work to be carried out.

What costs have already been incurred for the project?	Actual costs, or ACWP [Ext.]	Costs actually incurred.
Are schedule variances occurring?	SV = BCWP - BCWS	Schedule variance (SV)
What are the costs resulting from schedule variances?	CV = BCWP - ACWP	Cost Variance (CV)
How accurate was my planning? What are the rates for cost overrun/underrun?	CPI = BCWP /ACWP	Value index (CPI) showing the ratio of the increase in value to the actual costs.
What are the total costs to be expected if the cost variance continues?	EAC	Estimated costs at completion (EAC) resulting from the changed project processing? EAC is calculated as follows: EAC = (BCWS - BCWP) / CPI

Progress Analysis Process

Purpose

You use progress analysis to obtain information on the state of your project and how it is developing. This enables you to take corrective action if the project is varying from its plan.

In the Project System, deliverables are generally planned in activities. This means that project progress should be determined at activity level.

You can use the planned costs or the budget or the planned POC determined by the system to represent the planned services in Project System reports.

Progress analysis supplies current data at all times while the project is running. For more information, see Progress Analysis [Page 7] .

Process Flow

To enter data for progress analysis during the execution of your project, proceed as follows:

1. Create your project structures.
2. Enter a measurement method [Page 19] for the WBS element, activity, or activity element.

   If you do not define a measurement method, the system determines the valid one automatically - for example, from the default value you have defined in customizing for the object. See Determining the Measurement Method [Page 22] .
3. Enter the planned data for the project (costs, dates, milestones, and so on).

   Note that progress analysis only considers costs planned by cost element.
4. Enter the actual data for the project.
5. Determine the progress of your project.

   As part of this, the system:

   – Determines the planned and actual POC, based on the defined rules or estimated values

   – Calculates the BCWP and BCWS based on the reference factor (planned costs, budget)
6. Evaluate your project's progress in the information system.

   In the information system you can analyze the progress data, together with other project key figures. This gives you an overview of how your project has progressed over time, both planned and actual.

   See Evaluating Project Progress [Page 41] .

Result

Progress analysis supplies you with precise information on the state of your project, and the cost and schedule situation. You can recognize trends independently of the costs planned and posted in CO, and can take appropriate action.

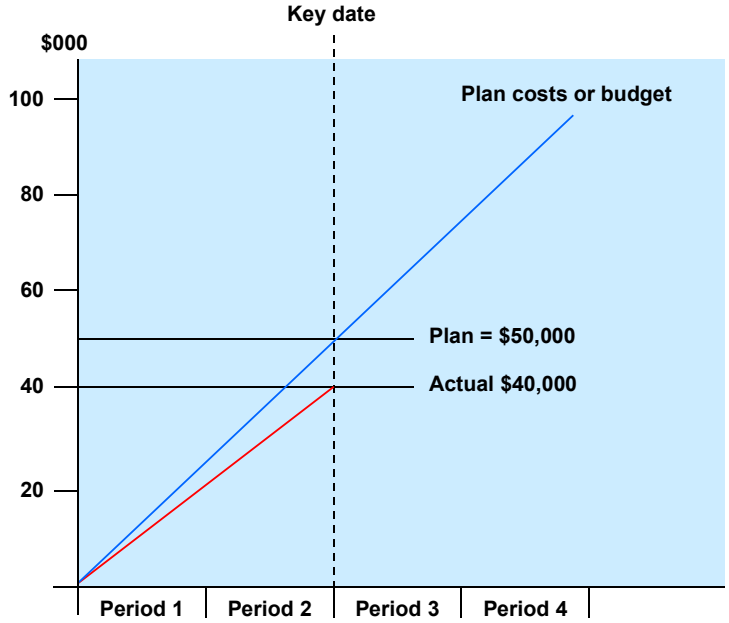
Example

The following example illustrates the importance of progress analysis for valuing your project's progress and the resulting schedule and cost variances.

Progress Analysis Versus Plan/Actual Comparison

You expect a customer project to incur costs of $100,000. The project lasts four periods. The planned costs are distributed evenly over these periods ($25,000 per period). Total actual costs posted for periods 1 and 2 are $40,000.

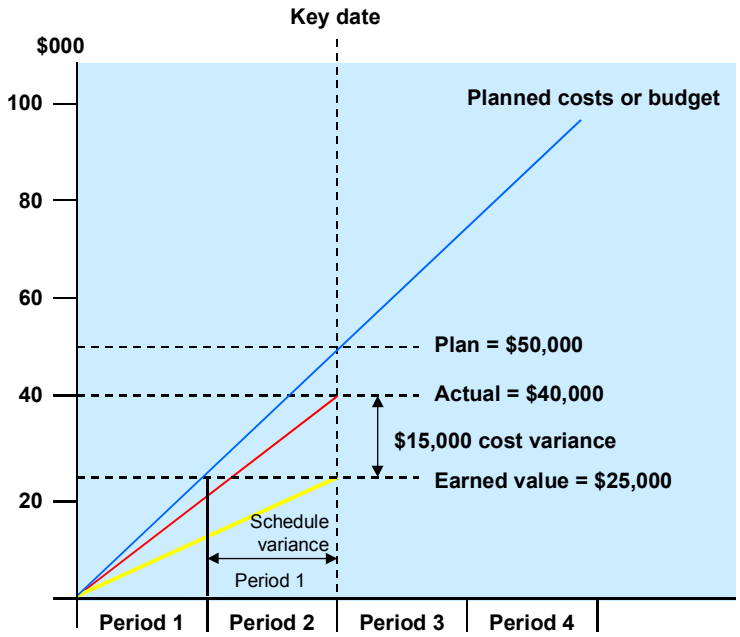
The graphic below illustrates the plan/actual comparison, showing a favorable project situation. The project costs seem likely to be less than the planned costs.



If you now look at the work actually done, the situation appears different.

In period 2, you run a progress analysis. The system determines the actual POC as follows: With overall planned costs of $100,000, the BCWP is $25,000 (overall planned costs * POC). As the actual costs at this point amount to $40,000, the BCWS is also $40,000, meaning that there is a cost variance of $15,000. In addition to the cost variance, the report shows that there is a time variance. The earned value of $25,000 should have been reached at the end of period 1. This means that the project is one period behind schedule.

Progress Analysis Process



Progress Calculation

Use

You use the function to:

- Determine the POC as of a particular point in time
- Calculate the value of the work performed up to a particular point in time

Progress determination provides you with the key figures you need for this:

- Percentage of completion [Ext.] (POC)

  The POC describes the ratio of the services rendered up to a particular date to the total work to be done in an activity or project.

  The system distinguishes between three different uses:

  – Non-aggregated values

    The values are displayed per object.

  – Aggregated values

    The system shows the values aggregated according to the project hierarchy.

  – For results analysis

    The system determines the aggregated POC for the billing element. In carrying out the aggregation, it takes account of the project elements subordinate to the billing element in the billing structure.

  The POCs are recorded under statistical key figures. You assign the statistical key figures to value categories so that the system can display them.

  You create the value categories for the POCs by choosing *Project System* → *Costs* → *Value Categories* → *Maintain Value Categories*.

  To assign them to value categories, choose *Project System* → *Progress* → *Assign Statistical Key Figures to Value Categories*.

- Earned value [Ext.]

  The earned value consists of the costs corresponding to the POC for an activity or project.

  The earned value is calculated by multiplying the POC by the overall planned costs. “Overall planned costs” is a synonym here for accumulated planned costs and the budget.

You can use the POC as the basis for results analysis.

See Results Analysis Methods [Ext.] and POC Method Based on the Earned Value (07) [Ext.] .

Prerequisite

A progress version [Page 18] must be defined in the Project System IMG. This is the means of stipulating the most important control factors for the progress calculation, such as:

- The base for determining the earned value

Progress Calculation

- Planning type or set of dates

The POC calculation requires a measurement method [Page 19] : You can:

- Use one of the measurement methods prescribed by SAP
- Define default measurement methods per object in customizing
- Define a measurement method directly in an object

If you work with statistical key figures, you must also make the following settings the Project System IMG:

- The statistical key figures where you want the POCs to be recorded

  You assign the statistical key figures to value categories so that the system can display them.

  For more information on the assignment, see Values in Progress Analysis [Page 44].

- Default cost element for recording values by cost element

  You define cost elements for cost elements groups and stipulate the default cost element.

  For more information, go to the Project System IMG and choose *Progress → Progress Analysis → Maintain Assignment of Cost Element Group*.

Features

Calculating the POC

The system uses measurement methods [Page 19] to determine planned and actual POCs for the following project components:

- WBS element
- Activities
- Activity elements
- Orders for projects

How the Calculation is Carried Out

The system uses a base, such as overall costs, and the POC to calculate actual and planned figures for the earned value (EV).

BCWS = Planned POC * overall costs

Actual EV = Actual POC * overall costs

The following uses “POC” and “actual POC” synonymously.

You define the base in the progress version in the Project System IMG. Possible bases include:

- Cost planned by cost element (current or CO version)
- Annual budget
- Overall budget

If you use planned costs as the base and determine the POC at activity level, the networks in question must be activity-assigned.

In the case of the planned costs, the planned costs accumulated by period are taken into account. However, the costs planned in hierarchy planning for the WBS element are not.

If you use the budget as the base, you can only evaluate the earned value in WBS elements.

You have agreed a budget with an ordering party. The earned value is to be determined with reference to this budget. Choose the agreed budget as the base.

You want to analyze the earned value with reference to your best- and worst-case scenario planning. Choose the respective CO plan versions as the earned value reference factor.

You want to analyze the expected earned value taking account of the change in the cost situation caused by changes to planning. Choose the planned costs from the forecast version as the earned value base. The earned value thus determined reflects the forecast value for services to be rendered up to completion of the project.

See Project Cost Forecast [Ext.] .

The earned value is rolled up in the project hierarchy. The earned value is NOT recalculated in a higher hierarchy level.

Taking Account of the Planning Type or Set of Dates

Delays usually result in cost variances. You can use different sets of dates or planning types when determining the planned earned value. In progress version customizing, you stipulate which planning type or set of dates the system should use for the calculation:

- Planning type or set of dates: Basic dates or forecast dates
- Key: Earliest or latest dates

Weighting

The POC of a project is arrived at by summarizing the POCs of the individual objects in line with the project hierarchy. You weight the POCs of the individual objects in order to represent the proportion of work package to the overall activity. You define the basis for the weighting in progress version customizing: example - *Work*. Inaccuracies at individual object level are ironed out in the aggregated display.

You want to analyze the progress of the internal activities only in your project. You stipulate the *Manual* weighting basis when you configure the progress version. In addition, you stipulate weighting factor 1 for internal activities and 0 for external activities.

Progress Calculation

Only the progress for internal activities is included in the POC aggregation. The effect of this is that external activity progress is not included in the calculation of project progress.

The system records the aggregated and non-aggregated values separately in the statistical key figures provided.

See Defining Key Figures for Progress Analysis [Ext.].

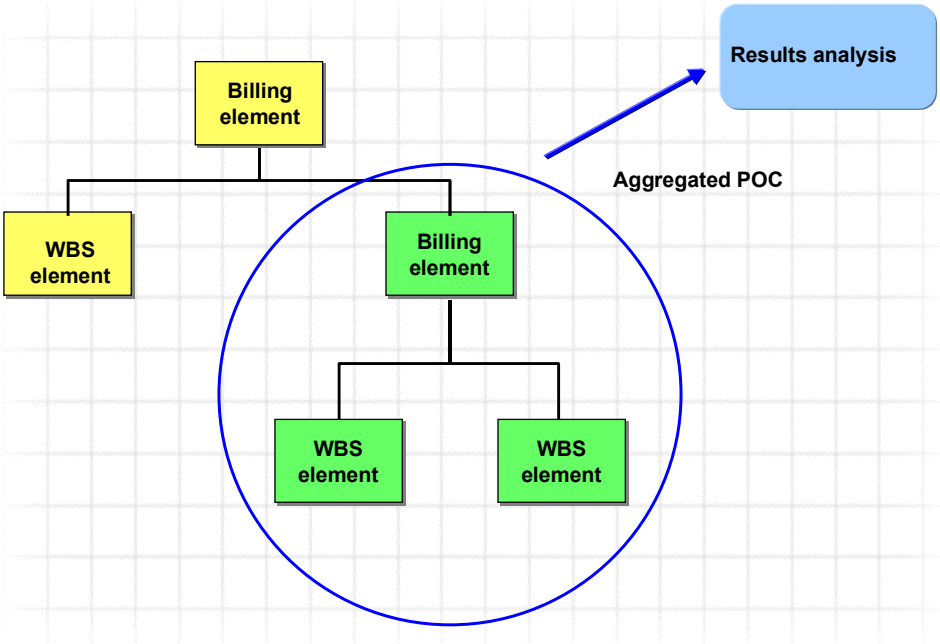
In the information system you can analyze the aggregate and non-aggregated POCs per object together.

The system shows the values aggregated according to the project hierarchy. Changes to the hierarchy or a different view lead to the aggregated values' being displayed incorrectly in the evaluation. If your project hierarchy changes, run progress analysis again.

The earned value in the aggregated display is totaled up using the project hierarchy, independently of the POC aggregation.

Recording the POC for Results Analysis

Only the POC from the billing element is relevant to results analysis. The system records the aggregate POC for the billing element under the statistical key figure with the usage POC for results analysis. The aggregation takes account of the objects from the billing structure only.



Correction Due to Changes in Plan

The POC and earned value are determined on the basis of information currently available in the system. If the plan is changed while the project is in progress, this affects the values in the progress calculation.

Changes in the plan lead to higher overall plan costs. If the POC does not change, the earned value increases.

You determine the POC in proportion to the quantity of finished documents. If the number of planned documents increases because of additional requirements being made of your project, the POC falls accordingly.

The person responsible for the project needs to analyze the effects of these changes on earlier periods. At the same time, there must not be any resulting inconsistencies with reports already made to the ordering party.

In the Project System you can arrive at a consistent assessment of the project by analyzing both the original values and the adjusted values. Correction postings arise only for the actual POC or earned value relating to past periods.

See Correction Postings Example [Ext.].

Evaluation at Cost Element Level

In some cases, you will find it useful to analyze cost and schedule variances at cost element level. This means that you can, for example, analyze the earned value in an activity separately according to work and material.

The system first determines the POC under the original cost element. The system then updates the determined values in summary under the cost element stipulated in customizing.

See Stipulating Default Cost Elements [Ext.] .

Activities

See Determining Progress [Page 39].

All the current values, values from past periods, and the plan values from future periods can be analyzed at any time, either in graphics or flexible lists. In the same way, you can evaluate the earned values corrected to reflect changes in the plan together with the original values.

A number of standard reports are available. However, you can define reports of your own.

See Evaluating Project Progress [Page 41] .

Progress Version

Definition

Progress versions are CO versions used only in progress analysis. The system records the progress analysis data in the progress version. You can evaluate the data at any time.

You use the project version to stipulate the parameters that control how the POC and earned value are calculated.

Use

You use progress versions in progress analysis. You require the progress version in:

- Object maintenance, when you maintain a measurement method for the object
- The execution phase, when you calculate progress
- The information system, when you access the progress analysis reports

Structure

You use the progress version to stipulate:

- The basic value for determining the POC
- Value for weighting the POC in the aggregation

  This is how you stipulate the weighting for the POCs of the various project components for the aggregation, to determine the POC for the next hierarchy level up.
- The set of dates used to determine the POC

  You define the following parameters:

  – Planning type or set of dates

  – At your option, the early/late key, which you use to stipulate that the activity has no float.
- That the actual or plan method be adopted in the other method if none is separately specified there No such adoption takes place for measurement methods based on estimation or secondary proportionality.

  If you used progress analysis in releases before 4.5A and want to continue using the parameters and estimated POCs you used there, run program R_CNEV_EVOF_EVFG_2_EVOP_EVPOC.

Measurement Methods

Definition

In the measurement method, you determine how the system calculates the percentage of completion (POC) for an object. We supply a number of measurement methods as standard. However, you can define your own in Project System customizing.

Use

Your choice of measurement method depends on your project and priorities.

If you use milestones to mark the transitions between the various phases of your project, choose the milestone measurement method. However, if the project is subject to continued further development that is not reproduced using milestones, it is better to use time proportionality.

You define measurement methods in conjunction with progress versions [Page 18] for the various project objects. You can define planned and actual measurement methods. The system then uses the valid method to calculate the POC.

See Determining the Measurement Method [Page 22] .

You can define measurement methods:

- As default values per object type in Project System customizing; choose *Progress* → *Progress Analysis* → *Define Measurement Method as Default Value*.
- In object maintenance, for the following objects:
  - WBS element
  - Activity
  - Activity elements

You can only assign measurement methods to orders in Project System customizing. You cannot maintain it in order processing.

The table below shows where you maintain the measurement methods for the various objects:

Object	Maintaining the Measurement Method
Projects in structure planning	*Details* → *General,* then *Progress* tab page
Projects in the project planning board	*Details* → *Detailed information on object,* then *Progress* tab page
WBS element	*Details* → *General,* then *Progress* tab page
Activities or activity elements	*Details* → *Activity/Element* → *General,* then *Progress* tab page
Assigned orders	In Project System customizing, under *Progress* → *Progress analysis*.

Structure

The measurement method consists of a measurement technique prescribed by the system and additional parameters that depend on the technique chosen.

Measurement Techniques

The measurement technique determines how the system uses the available data to determine the POC. In the R/3 System, the following measurement techniques are available:

- Start - Finish Rule [Page 24]
- Milestone Technique [Page 27]
- Éstimates [Page 30]
- Time-Proportionality [Page 34]
- Degree of processing [Page 32]

  If you choose this technique, the activities for which you want to use it must be confirmed.
- Quantity Proportionality [Page 37]
- Secondary Proportionality [Page 38]
- Cost Proportionality [Page 36]
- Actual = plan

  When you use this measurement technique, the system adopts the planned POC as the actual POC. You can only use this technique to process actual values.

Measurement Technique Parameters

You define additional parameters for the various measurement techniques, for the purpose of determining the POC. Examples:

- Maximum POC

  As long as the task has not been completed, that is, no actual finish date has been entered, the system will not allow you to have an actual POC that is higher than the maximum POC. The maximum POC prevents an overestimate of completion such as occurs when tasks are “almost finished” (also called the “90% syndrome”).
- Start POC

  Value for the initial POC in the **start-finish rule** measurement technique.
- Statistical key figures

  If you want to calculate the POC on a quantity-proportion basis, you must define the statistical key figure for the measurement method.

Integration

The table below provides an overview of the measurement techniques we recommend for each object:

Object	Plan	Actual	Comments
Internally processed activity	Milestone technique, cost proportional	Milestone technique, degree of processing	
Externally processed activity	Cost proportional, time proportional	Cost proportional, time proportional	
General costs activities	Cost proportional, milestone, estimate, start-finish	Cost proportional, milestone, estimate, start-finish	
Production order for project	Cost proportional	Cost proportional	The system uses a suitable weighting to aggregate the POC for the order in the activity.
WBS element	Milestone Quantity-proportional Start-finish Estimates Time-proportional Cost proportional	Milestone Quantity-proportional Start-finish Estimates Time-proportional Cost proportional	If activities are assigned to the WBS element, the POC should be calculated in the activity. The system uses a suitable weighting to aggregate the POC for the activities in the WBS element.

We recommend you use the same measurement method to determine both the planned and actual figures. This makes it easier to compare the values. Exception: the measurement methods which can only be used for actual values.

Determining the Measurement Method

Purpose

When you run the progress calculation, the system calculates the percentage of completion (POC) for the object in question. To this end, it determines the measurement method applying to the object.

Integration

You can use the progress version to specify whether an existing planned method is taken over as the actual method, and vice versa

If you do not specify a measurement method for the object when you maintain the object, the system adopts the planned/actual method.

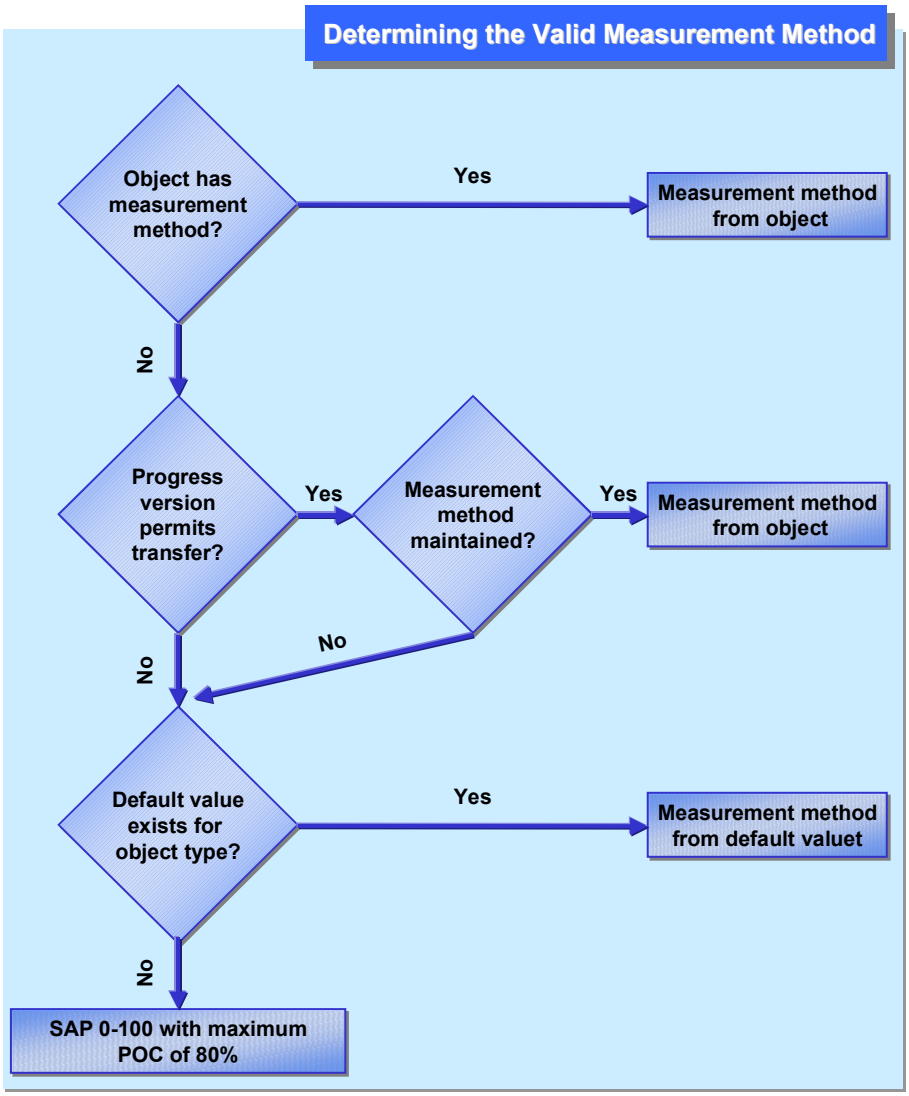
For details, see Progress Versions [Page 18]

You can define a default measurement method for each object type. You enter this setting in the Project System IMG by choosing *Progress* → *Progress Analysis* → *Define Measurement Method as Default Value.*

Process Flow

The system automatically determines the valid measurement method when you execute the progress calculation.

The following graphic shows you how the system determines the measurement method.



The system always determines a measurement method for the object. If the system finds that no measurement method has been prescribed, it adopts the method SAP 0-100. This method is prescribed; you cannot change it.

Result

The progress determination log or the progress analysis show the method applying to an object.

As the measurement method is determined on the basis of the progress version, the detailed data for the object only shows the measurement method if you have maintain a progress version for the object.

Start - Finish Rule

Use

Use the start - finish rule when you want a quick and easy measurement technique to get an initial rough picture of project progress. This measuring technique is based on scheduling. The work package duration for this technique should be more than three months.

Prerequisite

For the start-finish rule, the start and finish dates are maintained in the objects, as follows:

- Basic start date and basic finish date for the planned percentage of completion
- Actual start and actual finish date for the actual percentage of completion

You maintain planned dates in time scheduling, the project planning board, or structure planning.

You can either enter the actual dates yourself manually, or have the system determine them using completion confirmations.

See Entering Actual Dates [Ext.]

Features

When you use the start-finish rule, the percentage of completion at the start is increased from 0% to an initial value which you have maintained in Customizing for measurement methods. When your project is finished, the POC is 100%. In progress version [Page 18] customizing, you stipulate which set of dates the system should use to determine the POC:

The system we deliver as standard contains the following methods for the start-finish rule:

- **0 - 100**

  The initial POC is 0 %. The start date for the work package is irrelevant for progress analysis. The work package does not attain a POC of 100% until the work package is finished.

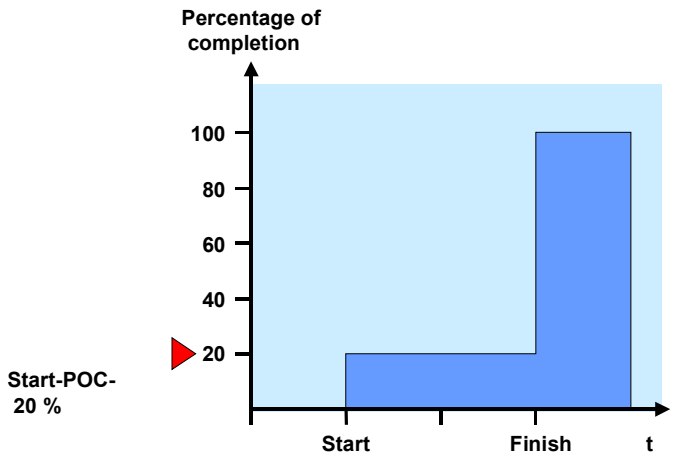
  Use the 0 - 100 method for work packages which fall within in a certain reporting period, for example, within one month.

- **20 - 80**

  The initial POC is 20 %. In this case, an initial POC of 20% is assumed at the start of the work package. Once the work package is finished, the POC increases by **80%** to 100%.

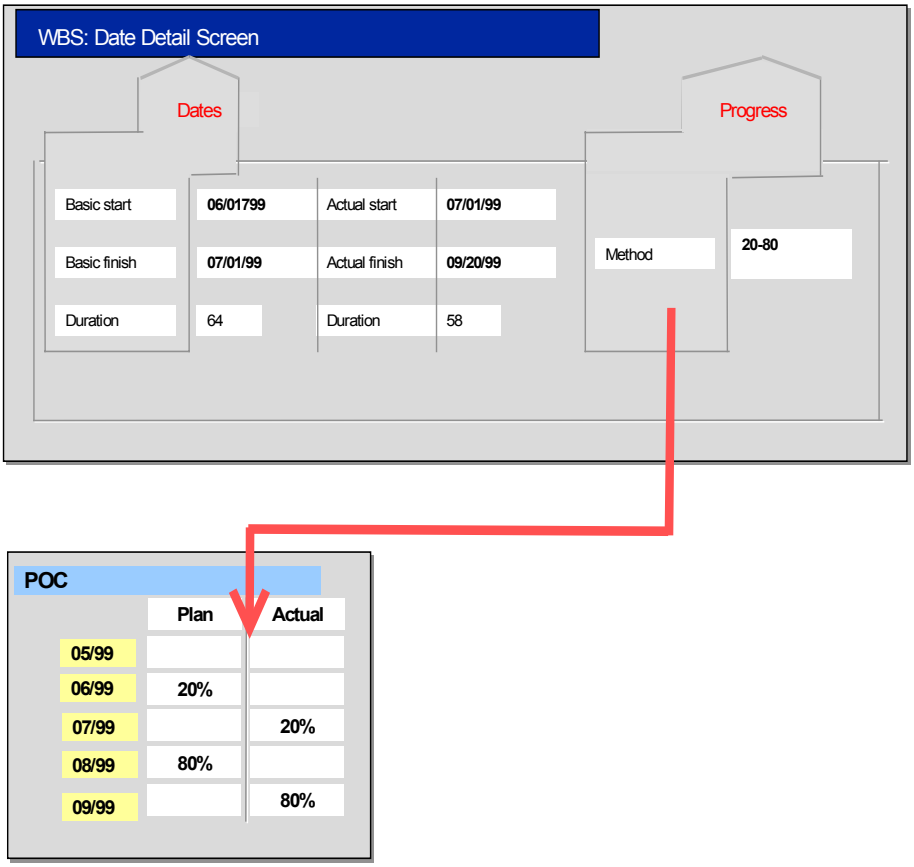
  At first, this assumption of a 20% POC may seem too optimistic. However, during execution of the project the POC remains at 20% even for work packages which are almost finished, which gives you a realistic estimate overall.

  You should only use this method if no more accurate estimates are available and the work package lasts for no more than three months.



Example

The graphic below shows how the system uses the 20-80 method to determine the POC on a schedule-related basis.



Start - Finish Rule

Milestone Technique

Use

You use this measurement technique if particular targets or events (called milestones) are defined.

The milestone technique is typically used in:

- Development work
- Design and engineering
- Production and assembly
- Cases where the ordering party prescribes milestones - for example, as the basis for payments

The milestone technique is date-related and is preferred on projects which last longer than three months.

Prerequisite

You must maintain milestones relevant to progress analysis in the project. You maintain planned dates in the WBS, network, project planning board, or structure planning.

See Creating Milestones [Ext.]

You must maintain the following data in the milestone detail screen for the system to take account of the milestone in progress analysis:

- If the milestone is maintained for a WBS element, the following must apply in the *Change Project: Milestone Overview* screen:
  - Set the indicator *EV* for progress analysis

    This flags the milestone as relevant for progress analysis.
  - A POC in percent

    The percentage is a cumulative value. That is, when the milestone is reached, the percentage of completion of the activity/WBS element **takes on** the POC that you specify here.
- If the milestone is maintained for a network activity, the following applies in the detail screen for the respective milestone:
  - Set the indicator for progress analysis

    This flags the milestone as relevant for progress analysis.
  - A POC in percent

    The percentage is a cumulative value. That is, when the milestone is reached, the percentage of completion of the activity/WBS element **takes on** the POC that you specify here.

Features

Each milestone represents a portion of the work completed or the work to be completed in an activity or WBS element. You can enter milestones for WBS elements and activities.

In the case of the planned POC; the system takes account of the following milestones:

- Schedule dates for milestones in the activity/activity element.

  In milestones for an activity or activity element, you can reference the milestone dates to the activity. You can enter a time interval - say, 10 hours - or a percentage of the activity duration. In network scheduling, the system determines the milestone dates in relation to the dates from the activity or activity element. If you have maintained a fixed date for the activity/activity element, the system likewise includes the fixed date in the scheduled dates for the milestone during scheduling. Fixed dates are not included if activity dates are shifted.

- Fixed date (basic or forecast date) for milestones in the WBS element

  In progress version [Page 18] customizing, you stipulate which set of dates the system should use to determine the POC:

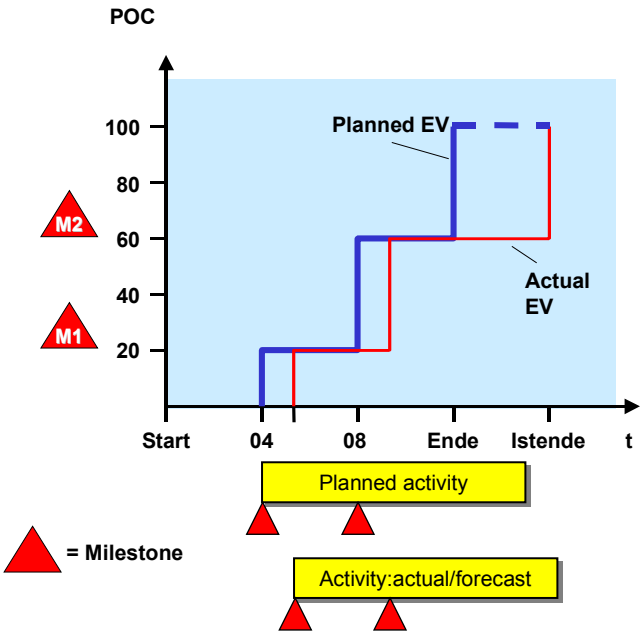
For the actual POC, the system takes account of the actual milestone dates. You maintain actual dates manually when the milestone is reached, or the system takes them from the completion confirmation.

If you set the automatic milestone indicator in the completion confirmation, the system automatically adopts the actual dates from the confirmation as the actual milestone dates. Otherwise, when you save, the system asks for confirmation when you save the confirmation to the milestone dates.

See Dates in Milestones [Ext.]

The system determines the POC as follows:

- If the basic or forecast date for the milestone is reached, the planned POC for the activity or WBS element is updated to reflect the POC defined in the milestone.
- When the actual date for the milestone is reached, the actual POC is updated to reflect the POC defined in the milestone. The actual date for the milestone may be reached, for example, when an activity is confirmed.



Example

You have maintained the following milestones for an activity:

Milestones	Scheduled Date	Actual Date	POC
M1	April 01, 1999	May 01, 1999	25 %
M2	June 01, 1999	July 01, 1999	60 %
Finish date	August 01, 1999	September 01, 1999	100 %

The system determines the POC as follows:

Period	Planned POC	Actual POC
04/99	25%	
05/99	25%	25%
06/99	60%	25%
07/99	60%	60%
08/99	100%	60%
09/99	100%	100%

Estimates

Use

Using this method involves making a subjective assessment of the project degree of completion. The method is schedule-based. This measuring technique is based on scheduling.

You use this technique when no other, objective method is available. The work package duration for this technique should be more than three months.

Prerequisite

- You must manually maintain a plan or actual percentage of completion (POC) for the WBS element/activity for each period. The system prescribes the periods on the basis of the dates maintained.

The following table gives you an overview of the menu paths to choose so that you can maintain data you need for your estimates:

Object	Maintain estimate data by choosing...
Projects in structure planning	*Details* → *General,* then *Progress* tab page, then choose *Estimated value*
Projects in the project planning board	*Details* → *Detailed information on object,* then *Progress* tab page, then choose *Estimated value*
WBS elements	*Details* → *General,* then *Progress* tab page, then choose *Estimated value*
Activity or activity elements	*Details* → *Activity/element* → *General,* then *Progress* tab page, then choose *Estimated value*

In addition, you can also enter a measurement method for estimates and a maximum percentage of completion in Project System customizing.

A maximum POC prevents an overestimate of completion such as occurs when tasks are “almost finished” (also called the “90% syndrome”). As long as the task has not been completed, that is, no actual finish date has been entered, the system will not allow you to have an actual POC that is higher than the maximum POC.

We recommend a maximum POC of 80% for the actual POC estimate.

Features

In this measurement method, the system adopts the percentage entered manually as the POC for the specified period.

You always enter the cumulative estimate. The values are not regarded as additive.

Example

Plan Dates	Estimated Values	Planned POC
05.99	10%	10%
06.99	30%	30%
07.99	100%	100%

Degree of Processing

Use

You use this measurement method to determine actual values for activities whose progress is mentioned in terms of internal activities.

Prerequisite

The activities or activity elements for which you want to use this technique must be confirmed.

Features

When you use this measurement technique, the degree of processing from the confirmation becomes the percentage of completion.

You can maintain the POC manually in the confirmation for the activity/activity elements or have the system calculate it from the data in the confirmation.

See Calculation of Actual Work, Remaining Work and the Degree of Processing [Ext.] .

Example

You confirm activity 0010 “Assembly” with a 20% degree of processing. This means that the actual POC for the activity is also 20%.

Degree of Processing

Confirmation

		Start	Finish	Duration	Labor
Activity	0010				
Work center	1000				
DOP in %	20%				
Posting date	June 20,1999				
				57 days	100 H
Confirmation					
Actual		June 1,1999	June 20,1999	10 days	20 H
Forecast				47 days	80 H

Progress Calculation

	Plan	Act.
05/99		
06/99		20%
07/99		
08/99		
09/99		

Time Proportionality

Use

This measurement technique is suitable for work packages where you are planning activities which cover the whole period of processing, such as consulting or administration.

Prerequisites

You must maintain the start and finish dates for the WBS element or activity:

For the Planned POC: Basic Dates

You maintain planned dates for WBS elements in date planning, the project planning board, or structure planning. These are the basic start and basic finish dates.

The system schedules the matching dates for the activities.

For the Actual POC: Actual Dates

The actual dates in WBS elements: Actual start and actual finish

The actual dates in activities are as follows:

- If no final confirmation has been made for the activity: actual start and duration
- If a final confirmation **has** been made for the activity: actual start and actual finish

You can either enter the actual dates yourself manually, or have the system determine them using confirmations.

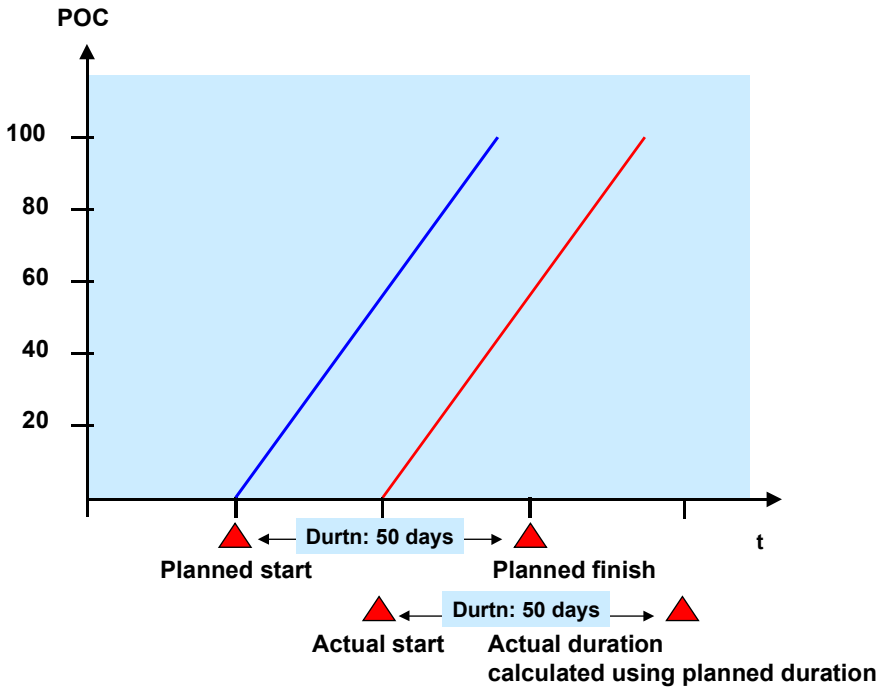
Features

The system determines the duration using the:

- Dates maintained
- Factory calendar applying to the object

In progress version [Page 18] customizing, you stipulate which set of dates the system should use to determine the POC:

The system assumes linear progress of the project over time. It determines the POC in proportion to the total project duration. Until a final confirmation is entered for the activity, the system adopts the planned overall duration as the actual overall duration.



The system uses the factory calendar to determine the duration. This means that the POC calculation takes account of events such as plant shutdowns. As a result, the POC for a particular period may increase only by an insignificant amount, or not at all.

Example

You have maintained the following dates for an activity:

Planning type	Basic start - basic finish
Date	01/25/99 - 04/16/99

This results in the following POC values:

Period	1	2	3	4	Overall duration
Workdays per factory calendar - plan	5	20	23	2	50 days
Planned POC	10%	50%	96%	100%	

Cost Proportionality

Use

This measurement technique is suitable for work packages where costs and services have a constant relationship.

Prerequisites

Costs must have been planned in the object, or actual costs posted to it, by period.

The system does not take account of costs from hierarchy planning in the WBS element.

Features

The system determines the percentage of completion (POC) for a period from the ratio of planned or actual costs to the overall planned costs. The system determines the planned or actual POC as follows:

BCWS = Planned costs/overall costs * 100

Actual EV = Actual costs/overall costs * 100

The planned costs are the cumulative planned costs up to the time of the calculation. The overall planned costs are the cumulative planned costs over the duration of the work package. You use the progress version to stipulate which cost plan the system uses.

Example

A work package has overall costs of $100,000.

The table shows how the POC is determined with reference to the overall costs.

Period	1	2	3
Planned costs	10,000	50,000	100,000
Planned POC	10%	50%	100%
Actual costs	5,000	30,000	90,000
Actual POC	5%	30%	90%

Quantity Proportionality

Use

You use this measurement technique when countable events occur during the life of a work package. Typical examples of such events include production, creation or delivery of a particular number of drawings, films, or data carriers.

Integration

Quantities in the Project System are managed by means of statistical key figures. You maintain statistical key figures by going to the Project Management Basic Data menu and choosing *Standard structures* → *Statistical key figures*. Then choose *List display* to view a list of all the statistical key figures which have been maintained.

Prerequisites

You have defined a suitable measurement method in customizing. In the measurement method, you maintain the statistical key figure to which quantity proportionality is to refer. You can only maintain one key figure per method.

To create statistical key figures, go to the Project Management Basic Data menu and choose *Standard structures* → *Statistical key figures*. For this method, use only statistical key figures of the category *Total values*.

To maintain plan values for statistical key figures, go to the Project Planning menu and choose *Costs/Revenues* → *Statistical key figures*. You enter actual values from the Project Execution menu, by choosing *Completion Confirmation* → *Statistical key figures*.

Features

The system determines the percentage of completion (POC) as the ratio of the quantity unit to the overall planned quantity.

Planned POC = Planned quantity / overall quantity * 100

Actual POC = Actual quantity / overall quantity * 100

Example

You want to create 60 drawings for an activity. You distributed the planned quantities evenly over the periods. You take the cumulative POC for the individual periods from the table.

Period	1	2	3	4
Planned quantity, accumulated	15	30	45	60
Planned POC	25%	50%	75%	100%
Confirmed quantities, accumulated	12	30	42	60
Actual POC	20%	50%	70%	100%

Secondary Proportionality

Use

Use secondary proportionality when you have a definite correspondence between work packages in project progress and can apportion the effort accordingly.

Prerequisites

You must maintain a base object for the WBS element or activity.

You can do this using the Project Builder, the project planning board, or structure planning. The procedure is the same in all three.

Select an project object and choose
This brings up the *Change WBS Element* dialog box, where you choose *Reference object*.

Features

In this measurement technique, the degree to which a WBS element or activity is finished is dependent upon the progress of another WBS element or another activity. You can use weighting to fix the relationship between the activities.

Example

In a network there are two activities, “Create drawings” and “Check drawings”. A drawing is only complete once it has been checked.

The POC of the activity “Check drawings” will be copied from the activity “Create drawings” when you use this measurement technique. You use milestones as the measurement method for activity 1, “Check drawings”.

Period	1	2	3	4
Milestone for activity 1	M1		M2	M3
POC	50%	50%	70%	100%
POC for activity 2 (dependent activity)	50%	50%	70%	100%

Calculating Your Project's Progress

Use

The system uses this function to calculate the percentage of completion (POC) and earned value. You can run the progress calculation in individual or collective processing any time you like. You can also run the calculation more than once - for example, if the plan changes.

Prerequisites

You must make the settings necessary for the progress calculation in the Project System IMG.

For more information, see Progress Analysis [Page 10] .

If you want to run the progress calculation in collective processing, you require a selection variant. You can create the selection variant in the initial screen for the collective agreement.

Procedure

1. Choose *Logistics* or *Accounting* → *Project System* → *Progress* → *Progress Determination* → *Individual Processing or Collective Processing.*
2. Enter the controlling area, as required.

   This brings you to the *Project Progress* screen.
3. Enter whichever of the following you require:
   - Project definition
   - WBS element
   - Network

     Set the *Include orders* indicator if you want networks and orders assigned to the project or WBS element to be included in the selection.
4. Enter the following parameters:
   - *Progress version*

     You use the progress version to stipulate various control parameters, such as the default method for the objects, reference factor, and set of dates.
   - *To period*

     You use this parameter to determine the date up to which actual values are calculated. The system always calculates plan values for the whole of the period between the planned start date and the planned finish date.

     You can specify an exact date instead of a period. To do this, choose . However, the system only takes account of the date for measurement methods defined on the basis of the "time proportionality" technique.
5. Select the process control fields you require:

6. Choose .

Result

The system selects the objects which satisfy the criteria specified and determines which measurement method [Page 22] is valid. For each object, the system then determines the planned and actual POC in the following configurations:

- Aggregated
- Not aggregated
- For Results Analysis

For more information on the POC, see Progress Calculation [Page 13] .

The system records the POCs determined for the various uses under the statistical key figures defined in Customizing.

See Defining Statistical Key Figures for Progress Analysis [Ext.].

The system takes the POC as the basis for calculating the planned and actual earned value (EV).

EV = POC x overall costs

The system records both the original values and the adjusted actual values.

For more information, see Defining Default Cost Elements [Ext.].

Correction postings are made only for actual values from preceding periods. Current updated values are always recorded in the current period.

For more information, read Correction Postings [Ext.] .

The system records the calculated values by cost element under the cost elements defined in Customizing.

The system also outputs a two-level log:

The basic list contains the number of objects:

- To which a method is assigned
- In which the plan/actual method was adopted
- In which the standard method was used

To call up the detailed list, select a line and choose *Next list level*. The detailed list contains the objects and the methods assigned to them.

You can evaluate values so determined at any time in the information system.

For more information, see Evaluating Project Progress [Page 41] .

Evaluating Project Progress

Use

You use this function to analyze the progress of your project.

Prerequisite

Progress has been calculated for a progress version.

Features

The percentage of completion (POC) and earned value are important project key figures. You can evaluate these values either at the level of the individual project components or for the whole project/subproject as an aggregate figure. In conjunction with other project key figures, the progress analysis values [Page 44] are available in the following report types:

- Structure-oriented report on progress analysis
- Hierarchy drilldown report
- Report Painter or Report Writer

To access the standard reports on progress analysis, choose *Logistics* or *Accounting* → *Project System* → *Information System* → *Progress*. We deliver the following reports as standard:

Structure Overview

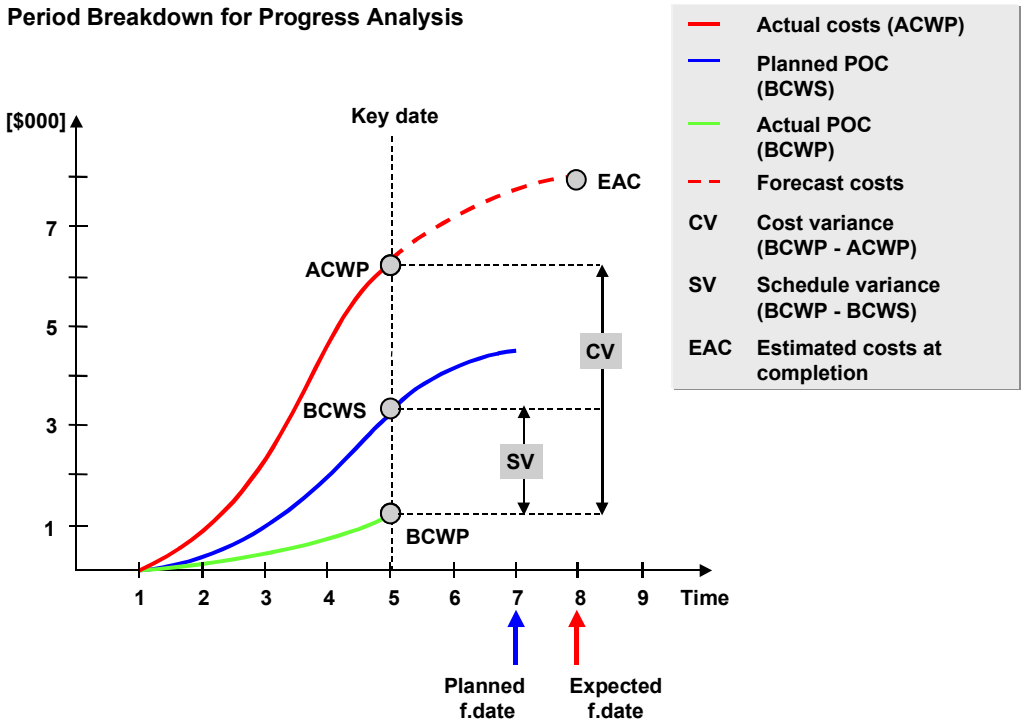
You can use the structure overview to evaluate the POC and earned value together. The system shows the values according to the project hierarchy.

You can use the structure overview to evaluate the POC and earned value in the following configurations:

- Aggregated
- Not aggregated
- Not adjusted
- Adjusted

From the hierarchy display, you can navigate to a project component in the period breakdown and the graphic displays.

Evaluating Project Progress



The tabular and graphical displays can only be accessed from the progress analysis structure report.

You can use the cost forecast [Ext.] to calculate the expected overall costs. To be able to analyze these value in the structure overview together with the progress values, you must, when accessing the report, specify the appropriate forecast version as plan version 2.

For more information, see Calling Up Reports on Progress Analysis [Page 46] .

Hierarchy Report

In the hierarchy reports, you can evaluate the earned value along with values relevant to progress analysis. The standard project information system contains the following reports:

- Progress analysis 12EVA1

  This contains a hierarchical overview of the following values:

  – BCWS (original value) accumulated up to the current period

  – Planned costs accumulated up to the current period

  – Overall plan, accumulated planned costs over the whole duration of the project

  – BCWP (original value)

  – Actual costs

  – Value variance

- Value index
- Work variance
- CTC
- EAC

- Progress analysis detail 12EVA2

  This report compares the aggregated values with the nonaggregated values. The report contains the following values:

  - BCWS
  - BCWS (adjusted)
  - Planned costs
  - BCWP
  - BCWP (adjusted)
  - Actual costs
  - Value variance
  - Value index
  - Work variance

You can create your own reports to complement the standard reports. The flexible nature of the project reports means that you can define further comparison factors for the values in progress analysis.

The report must be selected by means of both the plan version and the progress version. Use the standard reports as templates.

You cannot evaluate the POC in the hierarchy reports.

Report Painter Reports

You can define your own Report Painter reports to evaluate the POC and earned value by cost element. Report Painter reports are suited to analyzing these two factors together. We do not supply any standard Report Painter reports for progress analysis purposes.

Planned data is recorded under value type P1 and actual data is recorded under value type P2. The system records the original values under activity PEV1 and the adjusted values under PEV2.

Values in Progress Analysis

Use

The standard reports offer various values you can use to assess the progress of your project.

Features

The following fields are defined in the standard progress analysis reports:

- Planned POC in percent
- Actual POC in percent
- BCWS
- BCWP
- Cost variance (CV)
- Schedule variance (SV)
- Value index (CPI)
- Estimated costs at completion (EAC)

Planned POC

The planned POC is the value of the work planned for up to a certain point in time, expressed as a percentage of all the work required.

The following parameters are available in Customizing for the planned percentage of completion:

- Weighting for the POC aggregation
- Planning type or set of dates used to determine the planned POC
- Default measurement method for plan values per object type

For more information, see Progress Calculation [Page 13] .

Actual POC

The actual POC is the value of the work done up to a certain point in time, expressed as a percentage of all the work required.

The following parameters are available in Customizing for the actual percentage of completion:

- Weighting for the POC aggregation
- Default measurement method for actual values per object type

For more information, see Progress Calculation [Page 13] .

Budget Cost of Work Schedule (BCWS [Ext.])

The BCWS is the value of the planned activity at a particular point in time. It is a realistic basis for comparison with the actual POC. The system calculates the BCWS by multiplying the planned POC by the overall value planned for the work to be carried out (base). In Project System customizing, you stipulate which reference value the system should use to determine the POC:

You use either an approved cost plan or the budget. You use the same base for both planned and actual values.

It is calculated as follows:

BCWS = Planned POC * overall costs

Budget Cost of Work Performed (BCWP [Ext.])

The BCWP is the value of the work done up to a certain point in time.

It is calculated as follows:

BCWP = Actual POC * overall costs

Actual Cost of Work Performed (ACWP [Ext.])

Costs incurred up to a particular date.

Work or Schedule Variance (SV)

The work/schedule variance represents the costs caused by a departure from schedule. It is the difference between the BCWS and BCWP.

SV = BCWP - BCWS

Cost Variance (CV)

This is the difference between the BCWP and the ACWP.

CV = BCWP - ACWP

Value Index (CPI)

Key figure which shows the extent to which the project has departed from plan during its execution. The value index represents the ratio of value flow to actual costs, expressed as a percentage.

CPI = BCWP /ACWP

Estimated Costs At Completion (EAC)

This is an estimate of the total costs which will have been incurred when the project is complete.

EAC = (BCWS - BCWP) / CPI

Baseline

You can see the baseline in the period breakdown in the information system. It shows the costs planned by period.

Calling Up Reports on Progress Analysis

Use

This report offers a structure-oriented overview of the POC and earned value figures. It shows the values in total and by period. You can branch directly from the period breakdown to the graphical value display.

Prerequisite

You have determined the progress relating to a progress version.

Procedure

1. Choose *Logistics* or *Accounting* → *Project System* → *Information System* → *Progress* → *Progress Analysis* → *Structure Overview.*

   The system may ask you to enter a PS info profile.

2. Enter the standard profile for progress analysis, *SAPPS_EV0001*, or a profile of your own.

   The system may ask you to enter a controlling area.

3. Enter the controlling area for your project and choose *Continue*.

   This brings you to the screen *Project Info System: Progress Analysis Initial Screen.*

4. Choose *Settings* → *Value display* → *Plan versions.*

   The *Plan Versions* dialog box appears.

5. Choose the correct plan version.

   To be able to analyze costs from the CO versions in the structure overview together with the progress values, you must, when accessing the report, specify the appropriate CO version (such as a forecast version) as plan version 2.

6. Specify the selection criteria:

7. Choose .

Result

The report shows the progress analysis values in line with the project hierarchy. Use the field selection [Ext.] to choose further fields for evaluation. In the overview, you can display both time-dependent values, such as the planned POC, and time-independent values, such as the method assigned to the project component.

Choose *Goto* → *Period breakdown* to display the time-dependent values for a project component.

If you do not want to display cumulative values, choose *Settings* → *Value display* → *Not cumulated*. The system displays the values in the period in which they occur, and inserts a totals line.

Values determined in the current period are shown in the period breakdown only.

Graphical Representation

From the period breakdown, choose *Goto* → *Graphic* → *Period breakdown* to access the graphical overview of the time-dependent values.

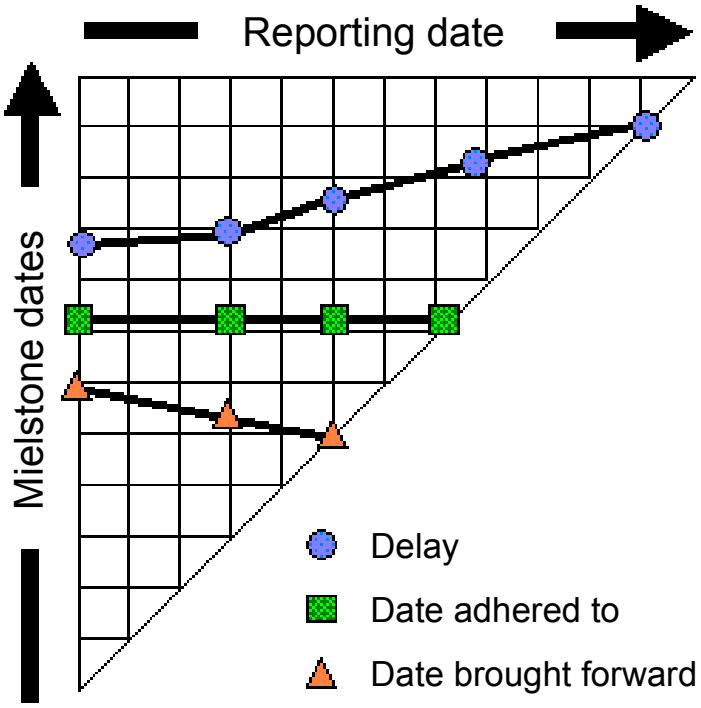
Use *Select field*s in the period breakdown to select the fields you want displayed in the graphic.

Milestone Trend Analysis (MTA)

Use

Milestone trend analysis is a simple method for analyzing the dates in a project and comparing them with planned data. You use it to recognize trends and deviations from the planned schedule quickly .

The scheduled dates of the milestones, which are relevant for the course of the project, are compared at various points in time. Deviations from the planned schedule are made apparent. In the graphical form a MTA chart is used, which is triangular where the sides are the times axes. The milestone dates are plotted against the report dates.



If the project runs according to plan, the curve remains horizontal. If the project deviates from plan, the curve rises (delay) or falls (in advance) with time.

Prerequisites

Flag the corresponding milestones as being relevant for *Trend analysis*.

On the chosen report dates create project versions, which also have the *Relevant for MTA* indicator set (at least one version is necessary for MTA).

Reschedule if you want to use data from the operative project or a simulation version and update this data.

Features

You can call up the milestone trend analysis from either the information system or the project planning board. It displays the dates of the relevant milestones in a project (or part of a project) at different report dates both in graphical and tabular form.

In the Information System you can limit the number of milestones to be displayed by using the usual selection facilities.

Either basic dates or forecast dates are used. Actual dates have priority over scheduled dates.

The information about the previous states of project is taken from the project versions This is compared with the current milestone data. In the project planning board you can use data from a simulation version instead of from the operative project.

In the milestone trend analysis, you can choose between two views:

- Historical curve

  This standard view displays those milestones that have the MTA indicator set at the time of the current report.

  These milestones are displayed across the entire reporting period, also when the indicator was not set for them at an earlier reporting time.

- Historical milestones

  In this view, those milestones for which the MTA indicator was set at an earlier reporting time are displayed. The indicator is not set for them for the current reporting period.

After selection, you can restrict both the milestones and the reporting time for the display.

In the tabular display the report dates and the dates of the relevant milestones are shown. You can go to the milestone detail screens directly from this table.

For more details about the function, refer to Executing the Milestone Trend Analysis [Page 50]

You can print the milestone trend analysis using the print command in the context menu.

Executing the Milestone Trend Analysis

Prerequisites

You have to have created milestones [Ext.] for the WBS elements and/or activities and set the *Trend analysis* indicator in the *Usage* section of the detail screen.

You must have created project versions in the information system [Ext.] for the required report dates.

To do this, in the Project Information System choose *Structure* → *Structure Overview* or in the Project Execution menu, choose *Period-End closing* → *Project Versions.*

Now choose *Evaluation* → *Save project version*.

On the dialog screen enter the version key, the version group, and if required a description of the version.

For the data to be used in milestone trend analysis, you have to set the *MTA relevant* indicator in this dialog box. This indicator is set as a default, since in general it does adversely affect performance.

Procedure

1. To access the milestone trend analysis [Page 48], choose *Logistics* or *Accounting* → *Project System* → *Information System* → *Progress* → *Milestone Trend Analysis*.

   A selection screen appears, in which you limit which milestones are displayed by selecting *projects*, *WBS elements*, *networks* and/or *activities*.

   You can determine whether basic dates or forecast dates are used for the milestone dates [Ext.] . You can also change which set of dates is used in the MTA.

   You use the *Use current data too* indicator to determine whether the dates from the operative project are used or whether only data from the project version is evaluated.

2. Choose .

   The MTA chart appears in which the dates of the selected milestones are plotted against the report dates.

   By double-clicking individual graphical elements, you can open dialog boxes for changing these elements. For instance if you double-click the axes you can change the axis text, scaling, and so on, or by double-clicking the curves the formatting of the data. For general information about this kind of graphic, refer to Chart OCX Presentation Graphics [Ext.]

3. If you want to see the table instead of the graphic, choose *Goto* → *Table*.

   The table with the milestone dates on the report dates appears.

   For here you can go to to the detail screen of a selected milestone by choosing *Edit* → *Choose*.

4. In both the graphic and the table you can restrict the number of milestones or report dates that are displayed by choosing *View* → *Choose dates.*

You can also access MTA in the project planning board. To do this, select the relevant WBS elements and choose *Goto* → *Milestone trend analysis*.