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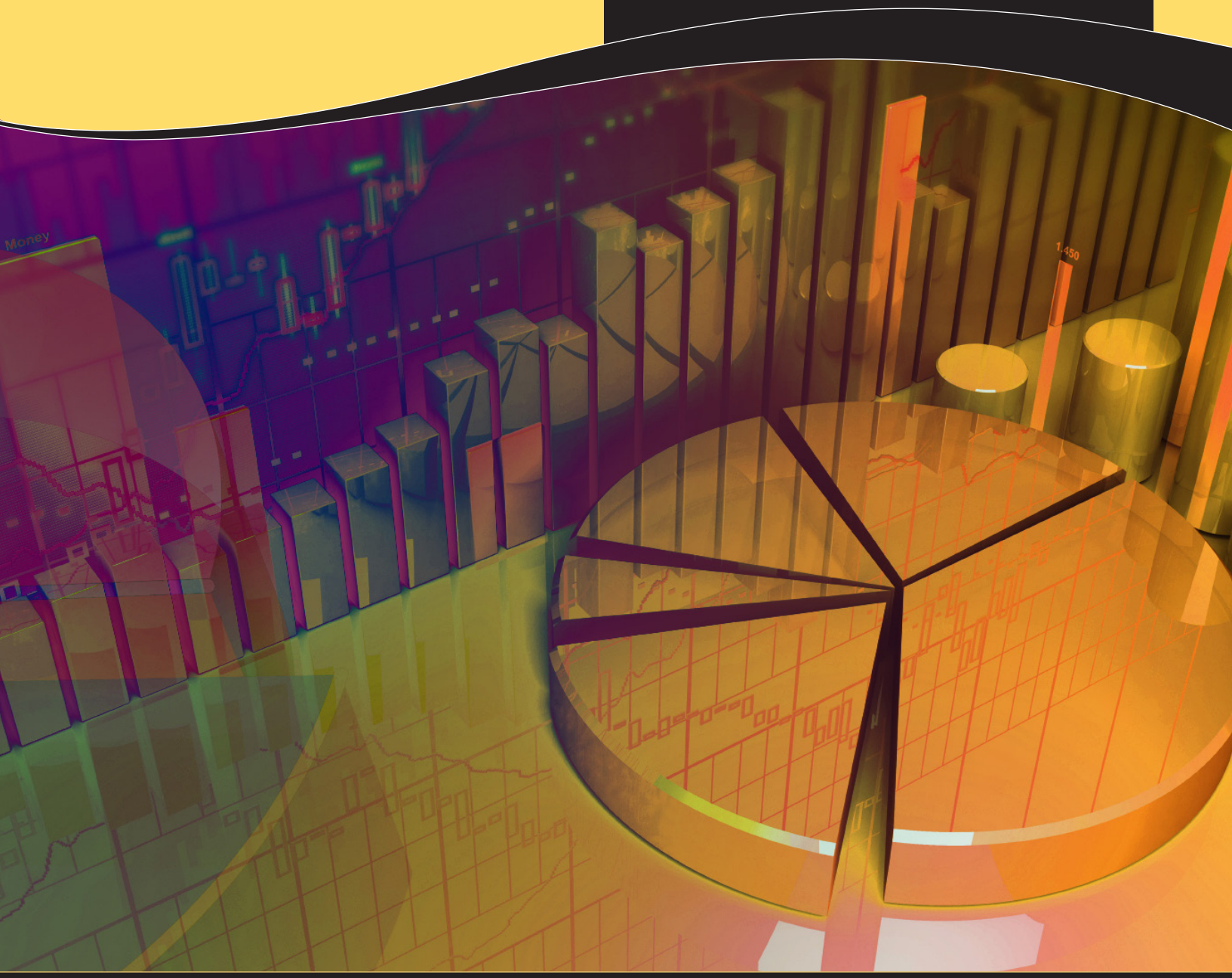
RESEARCH BRIEF

SIMPLIFIED EARNED VALUE MANAGEMENT



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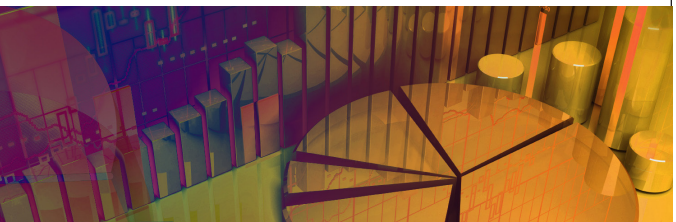
The key to controlling a project is time—time to react and make changes in order to correct variances to the plan. With time available to make corrections, success can be achieved. It doesn't help much to know the project is in trouble if there is no time left to make any corrections. So the focus of a project control system must be directed at timely information that rapidly exposes problems—giving the project manager and team the best shot at making corrections.

By this time, the PM and project team have created the project management plan, including the approved work breakdown structure, budget, and schedule. The team members have been assigned and task responsibilities have been made. All this detailed work that you have put into planning, preparing the task list, setting up a schedule, and determining the budget is about to pay off if the project is accomplished according to the project plan. With the fundamental plan in place, you can move through your project, monitoring trends and controlling costs and schedule with the best possible chance of success.



The following is a general outline of this project monitoring method:

SIMPLIFIED EARNED VALUE MANAGEMENT

Step 1: Prepare Projected Expenditure Forecast
Step 2: Estimate the Actual Progress for Each Task (Percent Complete or Earned Value)
Step 3: Compute Overall Project Progress (Percent Complete or Earned Value)
Step 4: Determine Actual Project Costs
Step 5: Determine the Schedule Status of the Project (Step 1 vs. Step 3)
Step 6: Determine the Budget Status of the Project (Step 3 vs. Step 4)

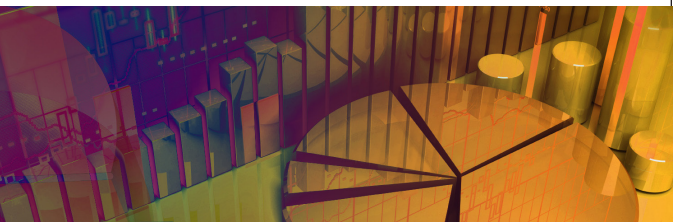
This method may sound difficult, but when you break the process into step-by-step actions it can be greatly simplified. This process was developed by PSMJ Resources' David Burstein and is now in widespread use throughout the design industry.

Step 1: Prepare Projected Expenditure Forecast

The first step in the process is to establish a projected expenditure forecast for the project. This creates a project baseline that is used to predict how fast the project team will spend the budget and complete the tasks in the scope of work.

Computing the projected expenditure forecast starts with the information in the project management plan—the task outline (WBS), task budgets, planned sequence of tasks, and the start and completion dates for each task. As shown in the following table, the task budgets are assigned to calendar periods and a total cumulative forecast is produced.

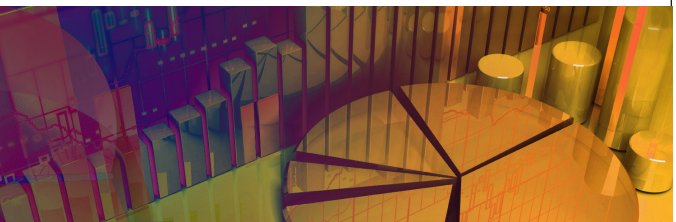
In this example, the budgets for each task are distributed uniformly throughout the task's duration. However, these can vary depending on the estimation of how rapidly each portion of the task will be performed.



CALCULATION OF PROJECTED EXPENDITURES

	Task Description	Total Budget ($/Task)	Monthly Staff-Hours ($/Month)	2002 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2003 Jan	Feb	Mar	Apr	May
A.	Develop Background	13,140	2,190	2,190	2,190	2,190	2,190	2,190	2,190											
B	Conduct Case Studies																			
1	Select Case Study Site	2,920	2,920			2,920														
2	Prepare Briefing Documents	2,960	987	987	987	987														
3	Develop Data Management Plan	7,650	2,550	2,550	2,550	2,550														
4	Visit Case Study Sites	19,700	3,283				3,283	3,283	3,283	3,283	3,283	3,283								
5	Analyze Waste Samples	17,500	2,917						2,917	2,917	2,917	2,917	2,917	2,917						
C	Evaluate Disposal Costs for Case Studies																			
1	Develop Computer Cost Models	8,060	1,343	1,343	1,343	1,343	1,343	1,343	1,343											
2	Perform Preliminary Designs	10,860	1,810						1,810	1,810	1,810	1,810	1,810	1,810						
3	Estimate Costs	8,820	1,470							1,470	1,470	1,470	1,470	1,470	1,470					
D	Evaluate Treatment, Recovery, Reuse	4,420	316	316	316	316	316	316	316	316	316	316	316	316	316	316	316			
E	Assess Cost Impacts	5,260	2,630													2,630	2,630			
F	Evaluate Cost Impact Models	6,240	6,240															6,240		
G	Project Reporting																			
1	Topical Reports																			
a	Background Data	8,940	4,470							4,470	4,470									
b	Case Study Site Visits	8,940	4,470										4,470	4,470						
c	Waste Sampling and Analysis	8,940	4,470												4,470	4,470				
2	Draft Report	18,100	9,050																9,050	9,050
3	Final Report	7,940	3,970																3,970	3,970
H	Project Management	13,400	788	788	788	788	788	788	788	788	788	788	788	788	788	788	788	788	788	789
Total monthly costs				8,174	8,174	11,094	7,920	7,920	12,647	15,054	15,054	10,584	11,771	11,771	7,044	8,204	3,734	7,028	13,808	13,809
Cumulative costs		173,790		8,174	16,348	27,442	35,362	43,282	55,929	70,983	86,037	96,621	108,392	120,163	127,207	135,411	139,145	146,173	159,981	173,790

After completing the calculations, the projected expenditure forecast can be created graphically, as shown in the following figure. A second vertical scale can be added on the right side of the chart—the left for budget dollars and the right for percent complete. On the right scale, 100 percent progress is set equal to the project budget. Then scale each 10 percent increment between 0 and 100 percent.



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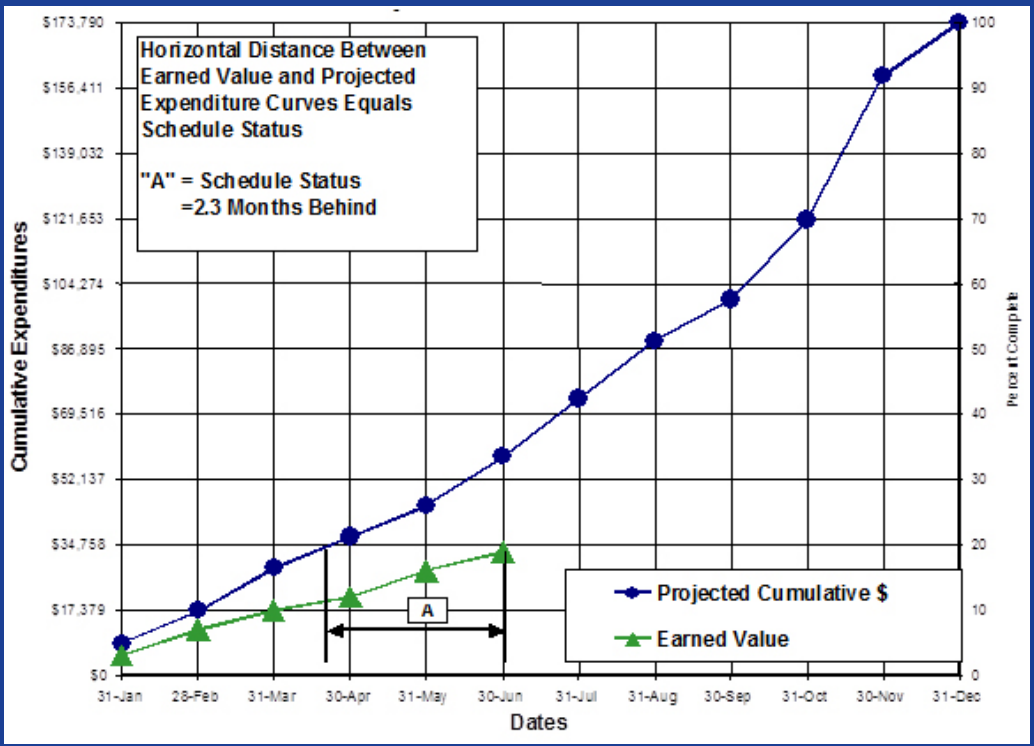
If the project follows the project management plan and the work is accomplished for the task budgets in the planned sequence by the schedule dates, the project will follow the projected expenditure curve. The work will be completed as the budget is being expended. In other words the "progress" of the work should be 100 percent complete when the budget has been 100 percent spent.



PROJECT SCHEDULE STATUS

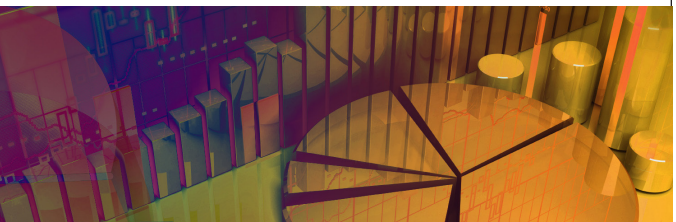
Examining this projected expenditure forecast, the following points can be made:

- *This represents the project baseline at the start of the project. This is how the project team intends to complete the work and spend the budget.*
- *This also indicates the expected progress (percentage complete) that should be achieved at any point during the project.*

For example, at the end of June, the project manager expects to have spent approximately $55,000 and have completed approximately 32 percent of the work. This curve provides the project manager with two fundamental performance measures for any point in time:

- *Projected expenditures (costs)*
- *Projected progress in percentage complete*

These performance measures will be used in the IBSM to determine two key variances— budget and schedule.



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Step 2: Estimate the Actual Progress for Each Task

This is the most critical step in the Simplified Earned Value Management process. It's the step that requires judgment on the part of the project manager. The key word here is progress—how much actual work has been accomplished? It doesn't matter how long (schedule duration) it has taken to perform the work or how much money (budget) that's been spent, progress must be a measure of the amount of work that has been accomplished.

Example Method of Calculating Progress of a Simple Project
Start with the concept of "earned value" as an estimate of how much progress has been made, expressed in dollars, for a given task. Mathematically, the formula is expressed as follows:

Earned Value = Percent Complete X Budget

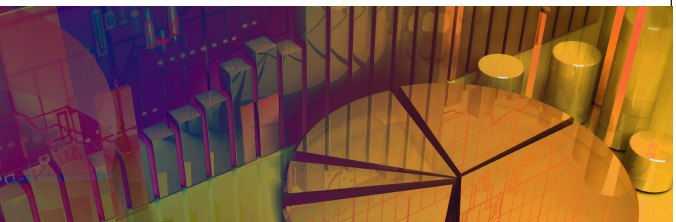
For example, if a project consists of laying 1,000 floor tiles and 400 have already been laid, the task can be said to be 40% complete. If the original budget for laying the tiles was $5,000, the earned value is 40% of $5,000, or $2,000.

Of course, calculating progress and determining earned value is not usually as simple as this example. In fact, even in this simple project, our calculation of earned value may not be correct.

Perhaps the entire sub-base had to be completed before any tile could be laid. In that case, if 400 of the 1,000 tiles had been laid, the project is really more than 40% complete and the earned value is more than $2,000.

To more accurately determine the earned value of our simple project, subdivide the project into its components, or tasks, as follows:

Project Task	*Budget*
Prepare floor	$500
Install sub base	$1,500
Install tile	$2,500
Cleanup	$500
	$5,000



Next determine the earned value of each task and add them to obtain the earned value of the total project, as follows:

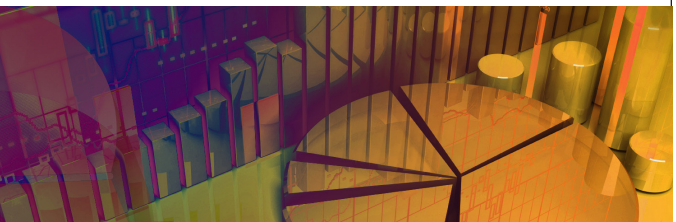
Project Task	*Budget*	*% Complete*	*Earned Value*
Prepare floor	$ 500	100%	$ 500
Install sub base	$1,500	100%	1,500
Install tile	$2,500	40%	1,000
Cleanup	$ 500	0%	0
	$5,000		***$3,000***

In this simple example the total project has an earned value of $3,000. In other words, it is 60% complete ($3,000 divided by $5,000). Note a very important point—this determination is made independently from any information regarding expenditures or elapsed time.

Compute the Earned Value for Each Task

The above example is for a simple project, but its methodology can be translated to estimate the progress (or earned value) of design projects.

First, as of a certain date (usually the last day of the month or end of each week on shorter projects), estimate the actual progress of each task in the project scope of work and express it as a percentage complete of the task. If necessary, create a breakdown of the major elements of work within the task and estimate the percentage completion of each. Then combine them together to determine the task percentage completion as done in the simple project example above.



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Handling Larger Tasks Using Milestones

One method is to develop measurable milestones for each major effort in the task outline. For example, a task defined as "prepare cost estimate" might be divided into the following milestones:

Prepare material take-off	**30%**
Obtain hardware prices	**10%**
Determine material unit costs	**10%**
Estimate labor hours	**20%**
Determine local wage rates	**5%**
Calculate extensions	**5%**
Final review	**10%**
Final corrections	**10%**
Total	**100%**

When the time comes to estimate the progress of this task, each milestone can be objectively reviewed to obtain a reasonably accurate estimate of the progress of the entire task. The use of milestones is most effective when they are:

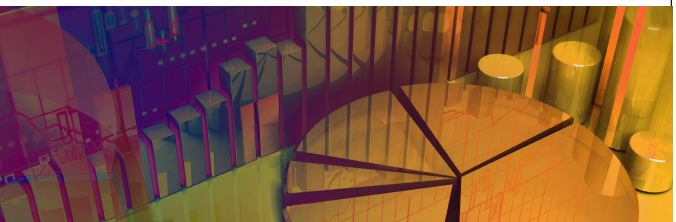
1. *Established by the people responsible for performing the work*
2. *Agreed upon at the outset of the task and not changed after it is begun*
3. *Defined in terms of measurable products, so as to reduce subjective judgments*

For Tasks That Contain a Series of Design Drawings

Another possible method to estimate progress of tasks that involve production of design drawings is to use a list of individual drawings and measure the progress of each individual drawing.

The sample Project Drawing Control Sheet shows how this technique could be used to estimate the progress of the structural drawings on a small design project.

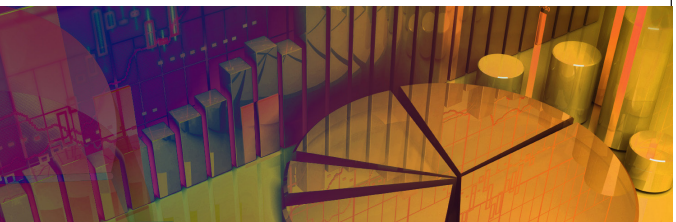
Care should be exercised in determining the progress of each drawing. If left up to each individual, it can become very subjective. Some firms implement a standard set of guidelines for estimating drawing percentage complete to mitigate the subjective estimates.



A sample set of Percentage Complete Guidelines follows:

PERCENTAGE COMPLETE GUIDELINES

ARCHITECTURAL DRAWINGS	PERCENT COMPLETE
1. Schematic Design	20%
2. Design Development	60%
3. Interdisciplinary Review	85%
4. Issued for Client Approval	95%
5. Issued for Construction	100%
STRUCTURAL DRAWINGS	
1. Design Calculations and Sketches	30%
2. Drafting/CAD	50%
3. Drawing Check	75%
4. Interdisciplinary Review	85%
5. Issued for Client Approval	95%
6. Issued for Construction	100%
MECHANICAL/ELECTRICAL UTILITIES	
1. Design Calculations	20%
2. Design Sketches and Coordination	35%
3. Final Drawings Complete	75%
4. Intra-discipline Check	85%
5. Squad Check	95%
6. Corrected and Issued	100%
PROCESS PIPING DRAWINGS	
1. Layout	15%
2. Design Calculations	35%
3. Check and Correct	50%
4. Isometrics	80%
5. Check and Correct	95%
6. Issued for Construction	100%
CIVIL DRAWINGS	
1. Design Calculations	30%
2. Drafting/CAD	60%
3. Interdisciplinary Check	75%
4. Issued for Client Approval	90%
5. Issued for Construction	100%



After the percentage complete is established for each drawing, multiply the value by the budget for that drawing to determine the earned value. Then total the earned value for the entire task and divide by the task budget to estimate the task percentage complete.

PROJECT DRAWING CONTROL SHEET

Project Name _____ Date _____ Previous Progress 80% = Drafting Complete

Discipline _____ Job No. _____ Last Period 100% = Ready for Bidding

Lead Engineer/Architect _____ Sheet _____ of _____ Overall Progress = ((BudgetxStatus)/Budget) = _____%

Drawing No.	*Drawing Title*	*Budget (labor – labor hrs. or $)*	*Estimated Completion Date*	*Status (% complete)*				
				20	40	60	80	100
S-1	Legend	28						
S-2	Foundation Plan	73						
S-3	Roof Plan	85						
S-4	Foundation sections	85						
S-5	Foundation sections	85						
S-6	Roof sections	85						
S-7	Roof sections and details	85						
S-8	Typical column sections	85						
S-9	Typical beam sections	85						
S-10	Structural details	66						
S-11	Structural details	66						
	Total labor hours	828						

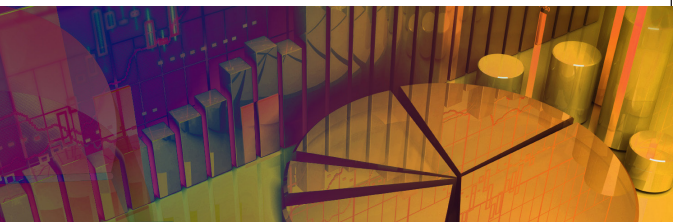
By tabulating a preliminary list of drawings, you can measure the progress of each discipline.

Another approach to check the percentage completion of each task is to have the person responsible estimate the effort (or work) remaining to accomplish the particular task from this point forward. Percentage complete of the task can then be calculated as follows:

Percentage Complete = 1 - [work remaining / original budget]

For example: Assume the original budget is $10,000 and the individual estimates that the work remaining to complete the task will take $8,000. Then:

Percentage Complete = 1 - (8000 / 10000)
= 1 - 0.8
= 0.2, or 20 percent complete



The project manager can establish a Project Status Record to have these estimates collected and use the results to establish or check the individual task completion percentages. The following is a sample form.

PROJECT STATUS RECORD

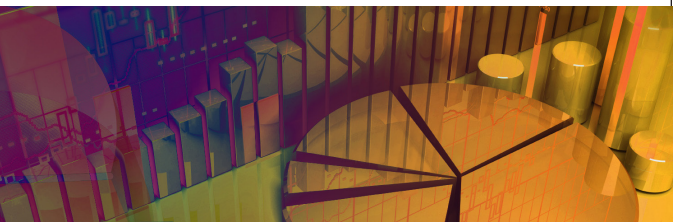
Department _____ Sheet _____ of _____

Project _____ Job No. _____ Prepared by _____ Date ____/ ____/ ____

Drawing no.	*Drawing Title (or Task)*	*Budget hours*			*Work Remaining to be Completed*									
		A/E	D	Total	A/E	D	A/E	D	A/E	D	A/E	D	A/D	D
	Supervision and Review	40	24	64	40	24	36	24	30	24	20	24		
	Coordination	40	--	40	36	--	32	--	24	--	16	--		
	Field Investigations	16	32	48	8	16	--	--	--	--	--	--		
	Specifications	40	--	40	40	--	40	--	40	--	32	--		
	Estimating	32	32	64	32	32	32	32	32	32	32	32		
	Final Corrections	24	60	84	24	60	24	60	24	60	24	60		
S-1	Legend	8	16	24	8	16	8	16	8	16	4	16		
S-2	Foundation Plan	30	32	62	30	32	30	32	16	16	--	--		
S-3	Roof Plan	30	32	62	30	32	30	32	16	16	--	--		
S-4	Foundation Sections	40	32	72	40	32	40	32	16	16	--	--		
S-5	Foundation Sections	40	32	72	40	32	40	32	40	32	20	16		
S-6	Roof Sections	40	32	72	40	32	40	32	20	16	8	16		
S-7	Roof Sections & Details	40	32	72	40	32	40	32	40	32	16	24		
S-8	Typ. Column Sections	40	32	72	40	32	40	32	20	16	8	16		
S-9	Typ. Beam Sections	40	32	72	40	32	40	32	32	32	16	24		
S-1-	Structural Details	24	32	56	24	32	24	32	24	32	24	32		
S-11	Structural Details	24	32	56	24	32	24	32	24	32	24	32		
	Totals	548	484	1,032	536	468	520	452	406	372	244	292		

A/E – Architect/Engineer D – Drafting Overall Progress = 1 – (hours remaining ÷ budget hours)

One way to determine budget is to periodically estimate the person-hours remaining to complete each task.



Step 3: Compute Overall Project Progress

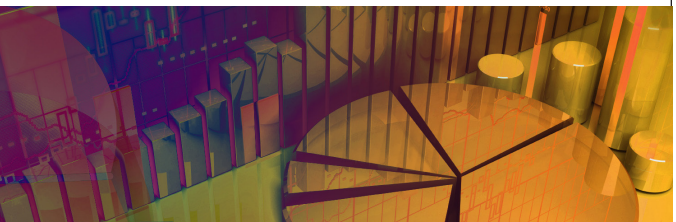
After the percentage completion has been determined for each task, all percentages are multiplied by the corresponding task budgets as shown in the following sample Calculations of Estimated Progress and Earned Value chart.

CALCULATIONS OF ESTIMATED PROGRESS AND EARNED VALUE

TASK DESCRIPTION	TASK BUDGET ($/TASK)	ESTIMATED PROGRESS (% COMPLETE)	EARNED VALUE
A. Develop Background Data	***13,140***	***X65***	***= 8,541***
B. Conduct Case Studies			
1. Select case study sites	***2,920***	***X100***	***= 2,920***
2. Prepare briefing documents	***2,960***	***X100***	***= 2,960***
3. Develop data management plan	***7,650***	***X100***	***= 7,650***
4. Visit cost study sites	***19,700***	***X20***	***= 3,940***
5. Analyze waste samples	***17,500***	***X0***	***= 0***
C. Estimate Disposal Costs for Case Studies			
1. Develop computer cost models	***8,060***	***X10***	***= 806***
2. Perform preliminary designs	***10,860***	***X0***	***= 0***
3. Estimate costs	***8,820***	***X0***	***= 0***
D. Evaluate Potential for Treatment, Recovery, Reuse	***4,420***	***X30***	***= 1,326***
E. Assess cost Impacts	***5,260***	***X0***	***= 0***
F. Evaluate Cost Impact Models	***6,240***	***X0***	***= 0***
G. Project Reporting			
1.Topical reports			
a. Background data	***8,940***	***X10***	***= 894***
b. Case study site visits	***8,940***	***X0***	***= 0***
c. Waste Sampling and analysis	***8,940***	***X0***	***= 0***
2. Draft report	***18,100***	***X0***	***= 0***
3. Final report	***7,940***	***X0***	***= 0***
H. Project Management	***13,400***	***X25***	***= 3,350***
TOTAL PROJECT PROGRESS	**173,790**		**32,387**

Total progress on the project = $32,387 / $173,790 = 0.186 = 18.6%

The individual task budgets may be used as weighting factors in order to determine equivalent progress on each task at a given point in time. These values can then be totaled and divided by the project budget to determine total progress on the project.



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The products of each multiplication are then totaled to obtain the earned value for the total project. Dividing the earned value at any point in time by the total project budget provides an estimate of overall project percent complete. For example, using the sample:

- ***Overall progress in earned value for the project is $32,387***
- ***Overall percentage completion is $32,387 divided by $173,790, or 18.6%***

Remember, the overall progress in earned value and the project percentage complete computation has nothing to do with how much money has been spent on the project.

The earned value progress (and percentage complete) can now be compared to:

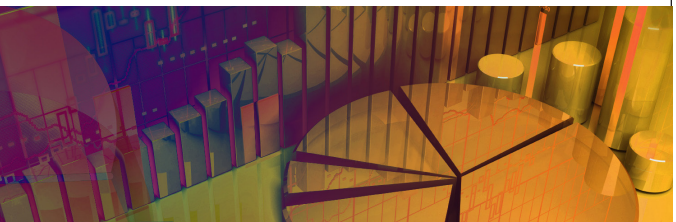
- ***Actual costs to determine budget variance***
- ***Forecast progress of the projected expenditure curve to determine schedule variance***

Step 4: Determine Actual Project Costs

Determining how many dollars have been charged to the project should be fairly straightforward. The place to start is the accounting department. Their reports should indicate how much has been charged to the job number, up to a certain date for which time and expense records are available. But you have to be careful not to get tripped up.

Despite your accounting system's accuracy, it will only report what has been reported to it. Even the most efficient accounting system can keep track of only the costs it has in its data files. If timesheets are submitted weekly, your accounting system will only reflect the work that was reported until the end of last week. If invoices have not come in from a consultant or a bill for travel expenses has not been entered, the accounting reports cannot indicate these costs.

No matter how up-to-date the accounting system, it will always require some amount of adjustments. For example, the bill for airplane tickets may come from the travel agent only once a month. If this happens a few days after the end of the month, this creates a one-month time lag between the time an employee orders a ticket and the time the accounting records capture it.



The same is true for billing from outside consultants and subconsultants. Considerable funds can be spent by outside consultants before their invoices finally get to your firm's accounting department and into accounts payable. Therefore, do not blindly accept the cost reports provided by the accounting department without questioning its content and matching it with your own expectations of what it should contain.

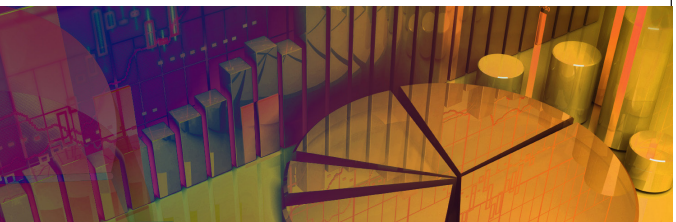
The project manager is the only one who should authorize any appropriate adjustments to the accounting records. You must know what individuals should be charging to the project by name and be very familiar with the costs that have been incurred on the project.

These should include those above and beyond those reported by the accounting system (including those for which data is still unavailable), and the PM should take these into account when analyzing the budget performance of the project.

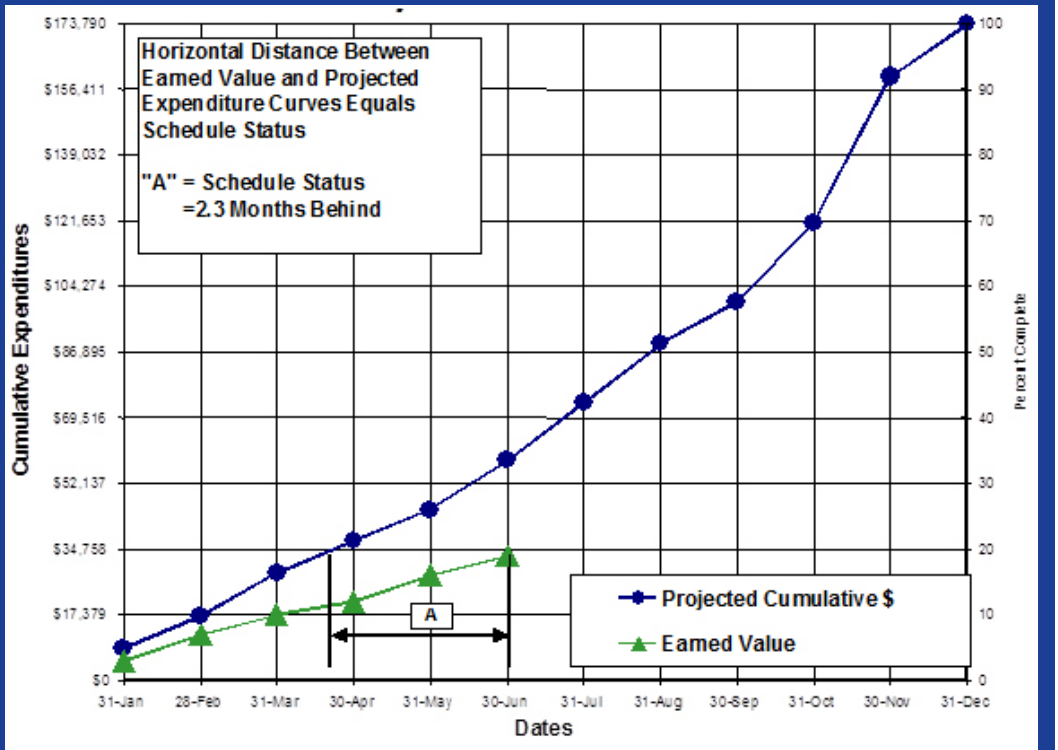
This is especially true on smaller projects of short duration where a week of labor or an unrecorded invoice can represent a significant portion of the total project expenditure.

Step 5: Determine The Schedule Status Of The Project

To determine the schedule status, compare the progress in percent complete that was anticipated against the actual progress you have made on the project. This is accomplished by comparing the progress value for this specific date on the projected expenditure curve with the earned value progress as shown in the following figure. The horizontal difference between the point on the projected expenditure curve and the project earned value curve is the amount that you are ahead of or behind schedule.



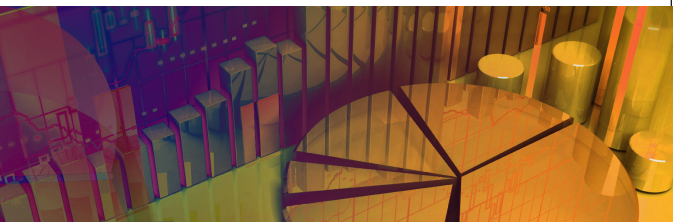
PROJECT SCHEDULE STATUS



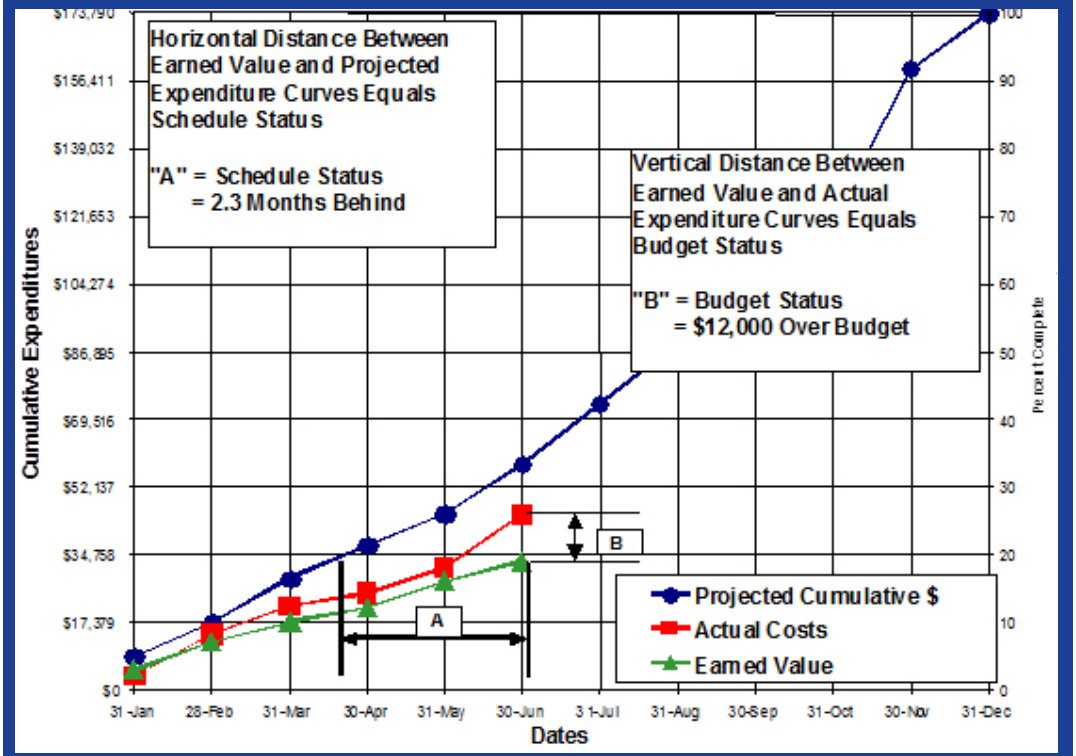
If you had projected to be 32 percent complete on June 30, but your actual progress as the chart shows indicates that you are only 20 percent complete, you are behind schedule. Conversely, if you had estimated to be 32 percent complete and you are actually 50 percent complete, you are ahead of schedule.

Step 6: Determine The Budget Status Of The Project

To determine the budget status, you compare the actual progress indicated by the earned values you have made on the project with the actual expenditures (project costs) the project has incurred. This is accomplished by comparing the overall project progress in earned value dollars with the actual project costs. The vertical difference between the end points of the line representing actual progress and the line showing actual cost will be the amount that you are over or under budget.

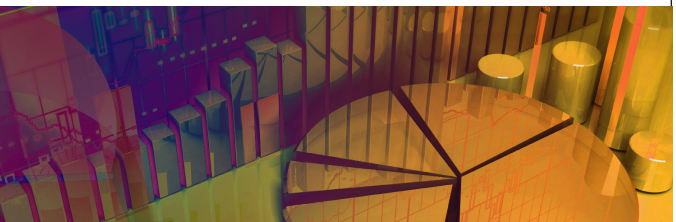


PROJECT BUDGET AND SCHEDULE STATUS



If the earned value indicates that you completed 40 percent of the work, but spent 60 percent of the money, you are over budget. If you have completed 40 percent of the work and only spent 30 percent of the money, you are in good shape.

Don't make the mistake of comparing projected expenditures (budgets) with actual expenditures (costs) in an attempt to determine overall project status. Doing so has lulled more than one project manager into a false sense of security. While actual expenditures may be less than projected, it doesn't necessarily mean that you are ahead of the game. It could be that you are so far behind schedule that you appear to be under budget.



Tracking Budgets For Small Jobs

What if the project is too small to break into 25 tasks? What if it is a small study with only three tasks? Can you use the earned value technique when the total budget is only $5,000? The answer is yes! The following is a single sheet that will employ the same earned value techniques and provide a standard method of tracking small jobs.

BUDGET TRACKING FOR SMALL JOBS

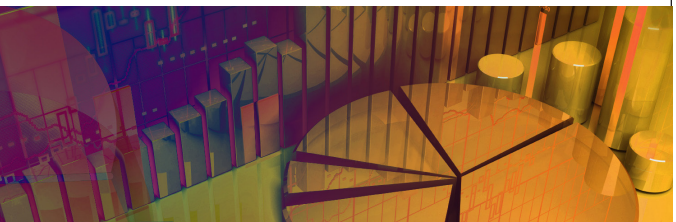
Work Element	Task Lead	Date	Budget	% Complete	Earned Value
Totals			$_____	E.V.	$
				Spent to Date	$
				Over/Under	$

Project Variance Analysis

At this point in the monitoring process, the project manager has determined the two key variances for the project—the schedule variance and the budget variance. For example, using the project budget and schedule status presented on the previous page, the:

- ***Schedule status indicates the project is 2.3 months behind schedule;*** *and*
- ***Budget status indicates the project is $12,000 over budget***

But what factors are causing these variances—both schedule and budget? It is not obvious without digging deeper into the status of individual tasks. As the saying goes, "The devil is in the details." For the PM to determine what corrective action should be taken, he or she must first determine the underlying causes of the variances. Examine each task individually with respect to both factors—schedule and budget.



Schedule Status of Each Task

Determining the schedule status of each task should not be difficult. For example, assuming you've developed a bar chart schedule for the various tasks, you can plot the percentage complete for each task along the length of each bar. For example, if the task "Gather field data" were 50 percent complete, you would color in the first 50 percent of the length of the bar and leave the remaining 50 percent blank.

Do this for each task. Then, draw a vertical line at today's date. The tasks that indicate uncompleted work to the left of the line are those behind schedule. The more blank space showing, the further behind schedule is the task. The length of the blank area can determine the actual amount of time that you are behind schedule. In addition, if the project control system includes a critical path method (CPM) processor, the reports from that program will also indicate which tasks (and activities) are behind schedule. These reports should indicate which tasks are farther behind and are most critical to the completion of the project.

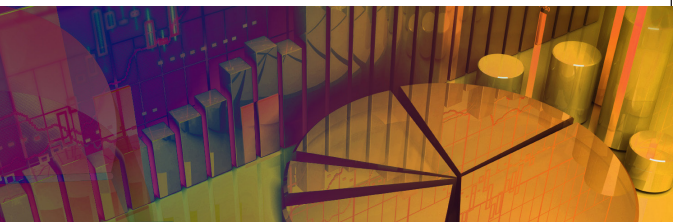
Using any or all of the above techniques, the PM should identify what tasks are behind and then meet with the responsible person for each task to determine the reason(s) and formulate an action plan to recover the lost time.

Budget Status Of Each Task

Determining the budget status for each individual task can be much more complex. It requires that you establish separate cost accounts for the costs for each task. This means that labor and expenses must be charged to separate job numbers for each task.

This can add considerable hardship to the lives of the project team members who may not know precisely on which task they are working.

Frequently a person will be working on two or more tasks simultaneously. This requires that they allocate their time to several tasks. This adds complexity to the time reporting system and can cause reporting errors as the person assigns time to each task. You must decide for yourself if it is worthwhile to track costs by individual task. If you decide it is necessary, then you can monitor the earned value of each task against the actual costs being reported. This will provide you with the information of which tasks are over budget and causing the overall budget variance.



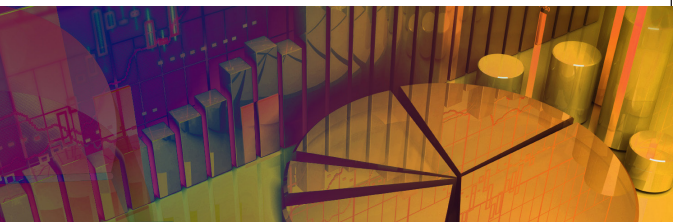
If you do not collect actual cost data against each task, you must evaluate the details of the accounting reports to analyze why the budget variance exists. Look for additional labor and expense charges from individuals who exceed their budgets. Compare the earned value progress against the total budgets by different departments or groups. Talk to the project staff about having to redo design efforts, potential changes in the scope of work, etc. Don't stop digging until you clearly understand the cause of the budget variance.

The Power Of Analyzing Schedule And Budget Trends

While it is essential to know the budget and schedule status of a project at a given point in time, monitoring trends can be even more revealing. For example, note the tabulation of project status trends in the following chart.

PROJECT MANAGEMENT RESPONSIBILITY

	PROJECT PERIOD	PROGRESS (%)	SCHEDULE	BUDGET STATUS
2011	January	3.2	0.3 months behind	$2,000 under
	February	6.7	0.8 months behind	$3,000 over
	March	9.4	1.1 months behind	$8,000 over
	April	11.5	1.7 months behind	$8,000 over
	May	15.8	2.0 months behind	$8,500 over
	June	18.6	2.3 months behind	$12,000 over
	July			
	August			
	September			
	October			
	November			
	December			
2012	January			
	February			
	March			
	April			
	May			
	June			
	July			



The "progress" column indicates a rather steady increase in the progress of the project— nothing particularly unusual.

The "schedule" column shows that the project started behind schedule almost from the outset and has deteriorated steadily. This steady deterioration in the schedule status indicates that some fundamental problem has existed from the beginning and any actions taken are not correcting the progress.

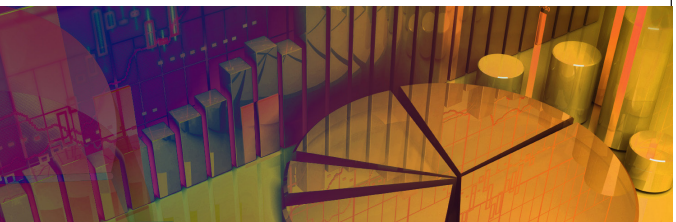
The "budget status" column tells a somewhat different story. The project started out smoothly, ran into a bit of trouble in February, and then generally stabilized until June, at which time the budget suddenly developed major problems. This trend indicates that something dramatic happened in June.

What Went Wrong?

If you find that your schedule is consistently losing ground every month, you should look for the reasons that might be causing it. Possible explanations could include:

1. *You have underestimated the amount of time required to do the project.*
2. *The staff on the job are not working efficiently.*
3. *Other projects you are involved in are interfering with your ability to focus on this one.*
4. *The client may be holding you up by not providing input as requested.*
5. *You aren't able to get the staff levels you need on the project.*
6. *You are spending too much time trying to resolve details.*
7. *You are examining too many design alternatives.*

Watch out also for sudden changes in the budget status in one, or a succession of, reporting periods.



If you find that your budget suddenly develops major problems in one month it may be because:

- *The client could have requested extra work, which your team subsequently performed, and you did not adjust your budget accordingly.*
- *You had a sudden influx of staff on your project that was not effective.*
- *You could have underestimated some direct costs on your project.*
- *You may have discovered an error and had to rework part of the project to make the necessary corrections.*
- *Costs have been charged to your project incorrectly.*

Monitoring trends in your budget and schedule status can be useful to see where your project is heading in the long run. But it's only effective if you monitor the project on a regular and frequent basis. Irregular or infrequent reporting will not accurately show the trends of your project status.

Summary

The project manager can practically and efficiently monitor the schedule and budget status of his or her project by using this IBSM methodology. It should require very little time and provide the PM with an "early warning system" to identify schedule and budget problems while there is still time to deal with them.

To recap, here are some of the key points for simplified earned value management:

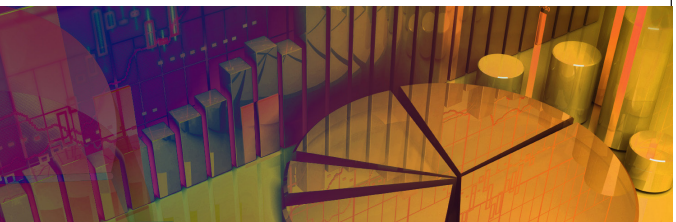
1. In order for this system to work, there must be a single task outline that links together the scope of services, schedule, and budget.

2. The first step, preparing an expenditure forecast, should be thought of as forecasting the rate of progress to be made, then expressing it in terms of expenditures.

3. Progress of a task can be reported as "earned value"; that is, the task budget multiplied by the actual percentage completion of that task. Determining this actual percentage completion is the most difficult task but is vital.

4. Overall project progress and percent complete can be computed by adding all the earned values for the various tasks, then dividing this sum by the project budget.

5. To ascertain the actual costs expended, do not rely solely on the information provided by the accounting department. Be sure to add costs that have been committed but have not yet been processed (such as subcontractor invoices, travel costs, etc.).



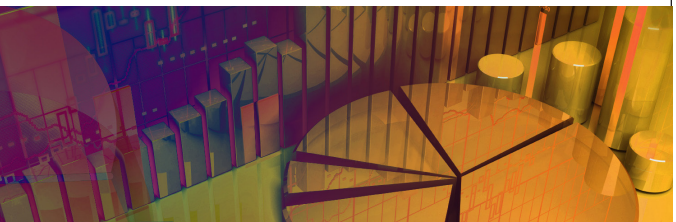
6. Don't track actual vs. planned expenditures in an attempt to monitor budget or schedule status. Actual progress from the earned value calculation must be tracked and compared to the other indicators.

7. Schedule status can be determined by comparing the forecast progress (or expenditures with the actual progress [(or earned value)]. If the actual progress is less than forecast, the schedule is in trouble.

8. Budget status can be determined by comparing the actual expenditures with the earned value. If the earned value is less than the actual expenditures, the budget is in trouble.

9. The Simplified Earned Value Management system can be used for any project with a defined scope. For large projects, each task should be monitored individually, the results graphed, and trends followed. On small projects, a simple spreadsheet format is adequate.

10. With this method it's easy to track the schedule status of each task, even for large projects. However, in order to track budget status for each task, separate account codes (or other methods) must be established to track the actual charges to these tasks.



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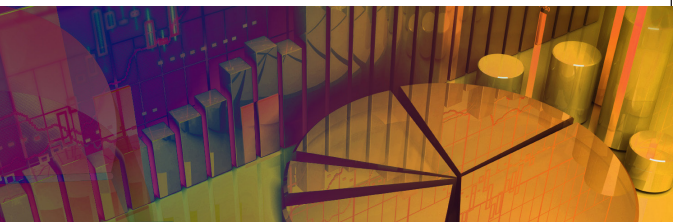

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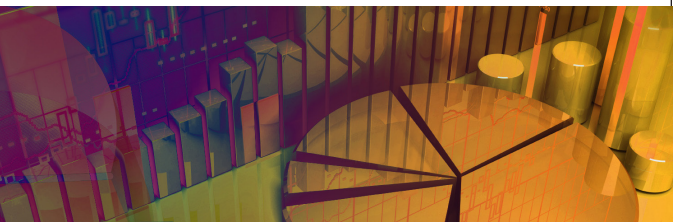

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