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SELECTED REPRINTS

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In this issue, two reprints are from the federal government. We hope that state and local procurement officers submit useful state and local publications that we cannot access.

We welcome all suggestions for reprints. Please submit your suggested reprints directly to:

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SELECTED REPRINT

EXAMPLE OF EARNED VALUE CONCEPT AND COST AND SCHEDULE VARIANCES FOR CAPITAL ASSETS

U.S. Office of Management and Budget*

Introduction. Earned value is a management technique that relates resource planning to schedules and to technical, cost, and schedule requirements. All work is planned, budgeted, and scheduled in time-phased "planned value" increments constituting a cost and schedule measurement baseline. There are two major objectives of an earned value system:to encourage contractors to use effective internal cost and schedule management control systems; and

- to permit the government to be able to rely on timely data produced by those systems for determining product-oriented contract status.

The example shown here illustrates how the earned value concept works. The analysis begins with a baseline schedule showing how much work is planned for each time period. The subsequent sections show how to calculate the deviation from the planned schedule (schedule variance) and the deviation from the planned cost (cost variance).

Baseline. For this hypothetical example, the baseline plan (planned value increments) in Table 1 shows that 6 work units (A-F) would be completed at a cost of $100 for the period covered by this report.

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* *Reprinted from U.S. Office of Management and Budget (1997, July), Capital Programming Guide (Supplement to Office of management and Budget Circular 11-A, Part 3: Planning, Budgeting, and Acquisitions of capital Assets), Washington, DC: OMB), Appendix Four, pp. 65-66.*

TABLE 1
Baseline Plan

	Work Units						
	A	B	C	D	E	F	Total
Planned value ($)	10	15	10	25	20	20	$100

Schedule Variance. As work is performed, it is "earned" on the same basis as it was planned, in dollars or other quantifiable units such as labor hours. Planned value compared with earned value measures the dollar volume of work planned vs. the equivalent dollar volume of work accomplished. Any difference is called a schedule variance. In contrast to what was planned, Table 2 shows that work unit D was not completed and work unit F was never started, or $35 of the planned work was not accomplished. As a result, the schedule variance shows that 35 percent of the work planned for this period was not done.

TABLE 2
Schedule Variance

	Work Units						
	A	B	C	D	E	F	Total
Planned value ($)	10	15	10	25	20	20	$100
Earned value ($)	10	15	10	10	20	0	$ 65
Schedule variance	0	0	0	-15	0	-20	$-35 = -35%

Cost Variance. Earned value compared with the actual cost incurred (from contractor and agency accounting systems, not through estimation techniques) for the work performed provides an objective measure of planned and actual cost. Any difference is called a cost variance. In this example, a *negative* variance means more money was spent for the work accomplished than was planned. Table 3 shows the calculation of cost variance. The work performed was planned to cost $65 and actually cost $91. The cost variance is 40 percent.

TABLE 3
Cost Variance

	Work Units						
	A	B	C	D	E	F	Total
Earned value ($)	10	15	10	10	20	0	$ 65
Actual cost ($)	9	22	8	30	22	0	$ 91
Cost variance	1	-7	2	-20	-2	0	$-26 = -40%

Spend Comparison. The typical spend comparison approach, whereby contractors report actual expenditures against planned expenditures, is not related to the work that was accomplished and is not a valid measure of program status. Table 4 shows a simple comparison of planned and actual spending which indicates the program is underrunning by 9 percent. When compared to the schedule and cost variance examples under an earned value system, the management information provided below gives a false indication of true program performance.

TABLE 4
Spend Comparison Approach

	Work Units						
	A	B	C	D	E	F	Total
Planned value ($)	10	15	10	25	20	20	$100
Actual cost ($)	9	22	8	30	22	0	$ 91
Variance	1	-7	2	-5	-2	20	$ 9 = 9%