

## EVM APPLICATION TO The Design Phase of a Software Development Project:

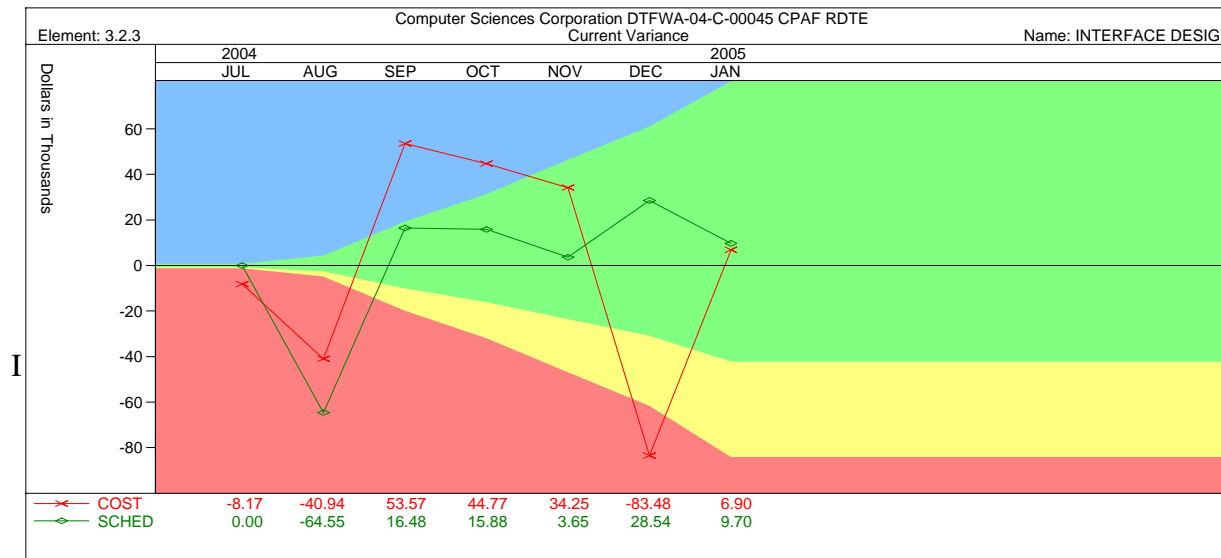
Earned Value will allow us to relate cost, schedule and software engineering technical accomplishment into a single set of metrics. The WEBSTER & WEBSTER Way will allow one to yield measurements that are valid, timely, and auditable. The project sample shows activity in the Design phase of a software development project.

**Figure No. 1**

WBS	DESCRIPTION	LEVEL		% Comp	SV	CV	VAC	CPI	BAC
3.2.3	INTERFACE DESIG	3		36.55	↔	↔	↔	1.008	2,296.5
3.2.3.1	SYSTEM DESIGN R	4	√	41.00	↔	↔	↔	0.994	1,215.5
3.2.3.2	DEVELOP RISK MI	4	√	0.00			↔	0.000	118.3
3.2.3.3	SYSTEM PERFORMA	4	√	0.00				0.000	0.0
3.2.3.4	System Performa	4	√	43.00	↔	↔	↔	1.074	739.5
3.2.3.5	SYSTEM PERFORMA	4	√	41.99	↓	↓	↔	0.724	46.2
3.2.3.6	TPM Variance An	4	√	2.96	↓	↓	↔	0.438	118.3
3.2.3.7	CSC Testbed Ada	4	√	0.00			↔	0.000	58.7
3.2.3.8	WJHTC Adaptatio	4	√	0.00				0.000	0.0

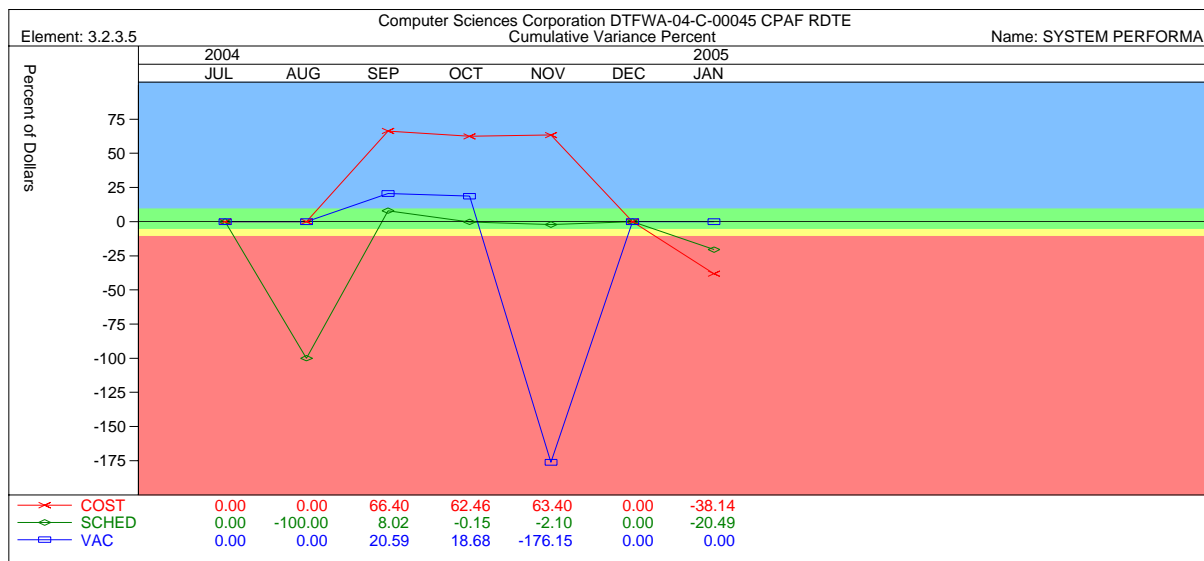
The project displays Build 1 designs, which will provide an open source frameworks, and toolkits that help developers build applications for the web. Second, by providing friendly and honest mailing lists where both newcomers and veterans discuss how to use software in their own build applications. The design elements are located at the Level 5 of the WBS; the areas we are applying earned value utilizing equivalents units as the EVM methodology for each work package. The Control Account, WBS 3.2.3 has been developed such that the Work Packages have been linked to tangible software metrics, such as CSCIs, Process Threads, and Use Cases, PG, Subsystems, and use cases realizations. We monitor the stability of these design elements. We believe that the stability of the design is critical to the success of the s/w project.

**Figure No. 2 Current Variance of WBS 3.2.3 Control Account**



As one can see, the major problems; both CV and SV in this project is in WBS 3.2.3.5. At Level 3, the reporting level this problem has been disguised. This is where the s/w metrics help in identifying early warnings of problems. Early on in the project, it was determined that these design elements would be monitored in conjunction with the EVM. WEBSTER & WEBSTER monitors change in the design elements: Changes in size (additions and deletions) and change in the design elements themselves. WEBSTER & WEBSTER monitors # of design elements added or deleted, the rate of design element change. Stability of tables and fields. As we go to the specific element where the cost drivers are the graphics display the specifics of this problem.

**Figure No. 3 Cumulative Variance Percent of WBS 3.2.3.5**



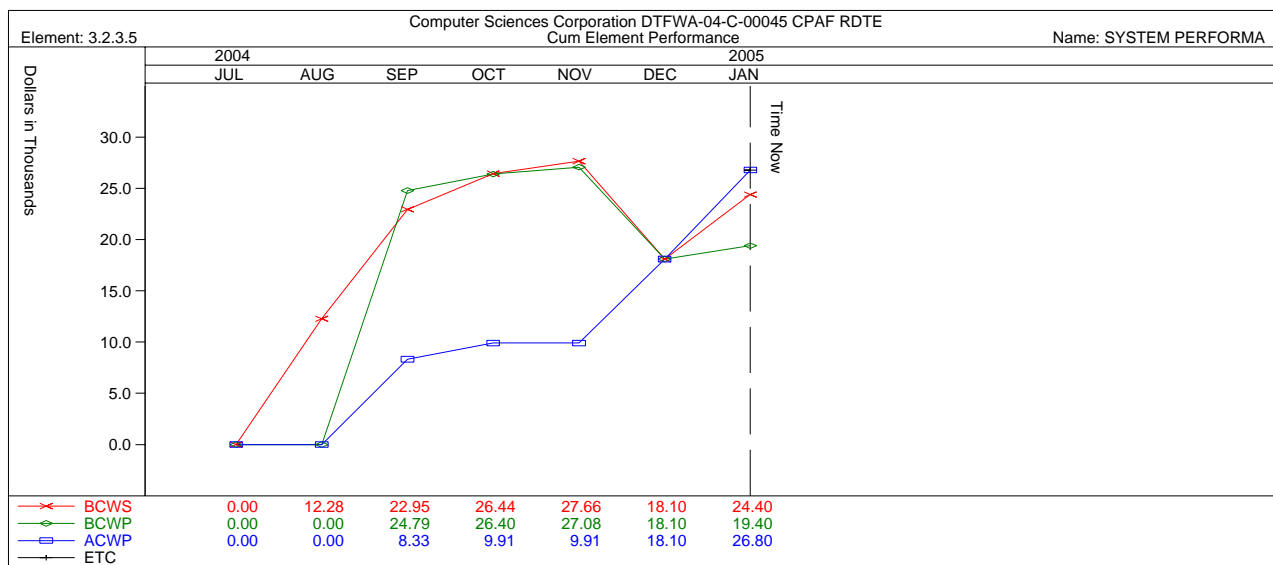
WEBSTER & WEBSTER looks at an entire suite of design size and stability metrics and data to reflect a direct correlation between the # of use cases planned against each Control Account compared with the actual # of cases and the cost variance experienced in this Control Account. The table below shows the variations in the number of use cases planned vs. actual. The Work Package had a budget of \$ 46,200, which was based upon an estimate of approximately 24 use Cases and Use Case Realizations at completion. This effort has experienced to date, 14 Use Cases to date and the WP is approximately 42% complete.

The ACWP to date is \$ 26,800.00. Our CPI for this WP is .72. This indicator says that if we continue to perform at this rate we will exceed the projected # of Use Cases. As the # of Use cases increase the more “unfavorable “ the CV. A sample of the Design Element Table is provided below:

**Table No.1 Design Size and Stability Metrics**

Design Elements	J	A	S	O	N	D	J	F	M	A	M	J	Total
Design Change													
Actual													
Size													
Actual													
Use Cases*	1	1	1	2	2	2	1	2	3	3	3	3	24
Actual	1	1	1	2	3	3	3						
CSCIs													
Actual													
Business Processes													
Actual													
Subsystems													
Actual													
Tables/fields													
Data Base Size (megabytes)		S	A	M	P	L	E						
Actual													

P = Planned A = Actual



The Cost and Schedule Variance is unfavorable in this Work Package. The cumulative data to date is provided below.

	<u>Cumulative-to-Date Data</u>					
BCWS	12.3	22.9	26.4	27.7	18.1	24.4
BCWP	0.0	24.8	26.4	27.1	18.1	19.4
ACWP	0.0	8.3	9.9	9.9	18.1	26.8
SCH VAR	-12.3	1.8	-0.0	-0.6	0.0	-5.0
SCH VAR %	-100.00	8.02	-0.15	-2.10	0.00	-20.49
SPI	0.000	1.080	0.998	0.979	1.000	0.795
COST VAR	0.0	16.5	16.5	17.2	0.0	-7.4
COST VAR %	0.00	66.40	62.46	63.40	0.00	-38.14
CPI	0.000	2.976	2.664	2.733	1.000	0.724