WHY NOT IMPLEMENT EVM?

(THE TOP TEN (OR SO) REASONS FOR NOT IMPLEMENTING EVM)

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Short Abstract

Earned Value Management has been practised and available for many years. Recently there has been a resurgence of interest in the technique. Major efforts are being made to rationalise the various standards across the world.
What is driving this change?
What value can the use of EVM add to a project?
Why do major customers mandate EVM to be used?
On the other hand, why are many Project Managers reluctant to use the technique?
I will explore these issues from a practitioner's point of view and discuss the experiences on a number of projects.

Keywords: EVM, Reasons, Value, Objections

Paper

Introduction and History

Earned Value Management is not a new technique. I shall start my paper by giving a quick resume of the history of EVM. EVM started in the sixties and was a natural development from PERT and Critical Path Analysis. The early work was done in the USA with Australia following on with its own standards and requirements. The development was done mostly on large projects with elements of US Government interest that later turned into a set of very prescriptive rules and a framework that took it beyond the reach of mere mortals into the realms of consultants and experts. Some might say that the development was too rigid and the result was that in the late eighties some of the processes and practices of EVM started to be reviewed and relaxed.

Figure 1 gives a view of some of the milestones in the development of what is now regarded as Performance Measurement and Control of Projects.

1959 **PERT and PERT/Cost — Milestone Charts And Rate-of Expenditure Curves**
— Dollars Spent Vs Estimates Of Percent Complete (DD 1097)
1963 **Earned Value Concept (MINUTEMAN)**
1964 Cost Accomplishment Concept (TITAN III)
1966 AF—Cost/schedule Planning And Control Specification (C/SPCS)
1967 **DOD—Cost/Schedule Control Systems Criteria (C/SCSC) (DODI 7000.2)**
1972 DOD—-Revised DODI 7000.2 and Issued the Joint Implementation Guide (JIG)
1972 NASA Marshall Space Flight Center—C/SPC
1975 DOE—Performance Measurement System (PMS)
1976 DOD—Revised the C/SCSC JIG
1980 DOD—Revised the C/SCSC JIG
1982 National Security Agency—Earned Value
1983 NASA—Goddard Space Flight Center—PMS
1984 FAA & NASA Lewis Research Center—PMS
1985 NASA Johnson Space Flight Center—PMS
1987 DOD—Revised DOD C/SCSC JIG
1988 NASA Marshall SFC—Revised PMS (MMI 8020.7C, 44 Criteria)
1989 **Australian DOD—DODI 7000.2**
1990 Canadian DOD—PMS
1991 DODI 5000.2 replaces DODI 7000.2
1992 National Oceanic And Atmospheric Administration (NOAA)—PMS
1993 Swedish FMV—C/SCSC
1994 Internal Revenue Service (IRS)—C/SCSC
1994 Federal Bureau Of Investigation (FBI) —C/SCSC
1996 **DODR 5000.2-R replaces DODI 5000.2 C/SCSC revised from 35 to 32 criteria**
1996 Revised JIG—Renamed Earned Value Management Implementation Guide (EVMIG)
1997 EVMIG Revised
1998 **MIL-STD 881B replaced by MIL HDBK 881**
2002 APM UK Guideline published
2004 Reciprocity with ANSI

Figure 1 History of Earned Value Management

As we reach 2006, interest in earned Value Management/ Cost and Schedule Control is growing. In the UK, the Chief of Defence Procurement is demanding use of EVM on New Projects, the Office of Government Commerce is also mandating its use. Special Interest Groups, associated with Project Management Communities all over world seem to be working to clarify and integrate standards. Again speaking from my own experience, in the UK the Association for Project Management (APM) has a very active SIG who are working to establish qualifications in the discipline having already achieved agreement with ANSI over their published standard. Ref. 1.

Why is there a demand for EVM

We find more and more high profile examples of the use of EVM, demonstrated at the increasing number of Conferences and Seminars on the topic. Some interesting examples that have been well documented include the preparations for the Football World Cup in Portugal, the development of Terminal 5 at Heathrow Airport and some legal proceeding in the USA in the aerospace world.

A question is therefore posed, why are customers asking for use of EVM when commissioning projects. What are the possible advantages of the system. To try to answer this let us look at a slide that has been produced by the UK National Audit Office (The NAO is the Government Watchdog on public expenditure) This diagram was published in the NAO Report on Major Defence Projects. See the NAO website for more information www.nao.org.uk

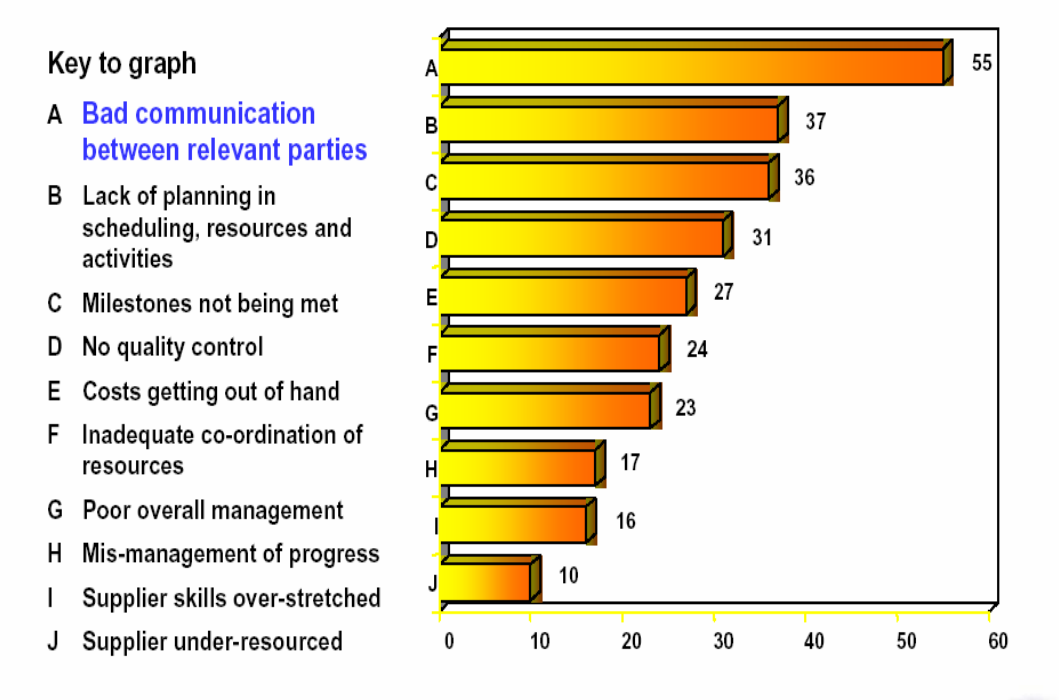

Figure 2 Major threats to project success

Looking at each of these issues, how can EVM help? From my experience I believe that the answer has to be a resounding "Yes"

EVM will only work effectively when planning is good

Good planning can make the situation clearer

A good plan is a definite aid to communication within the project , up and down the Supply Chain and in the relationship between Client and Supplier

A clear plan provides greater transparency, makes sure that responsibilities are defined and tasks allocated.

EVM requires good cost collection and accurate measurement of progress, this is critical in dealing with what has been referred to as "The Conspiracy of Optimism" i.e. the natural desire of the Project manager to minimise difficulties and the will to please the Customer. There is an objective view of the project.

Early warning of problems will draw management attention and help the project Manager to manage his resources more effectively.

A Simple View of EVM

The next section is included just as a reminder of how Earned Value Measurement actually works.

Let us start with a very simple concept, if we plan a project in detail and create estimates of the cumulative cost to completion and then track our actual costs as we go through, we get a diagram that looks like Figure 3, below.

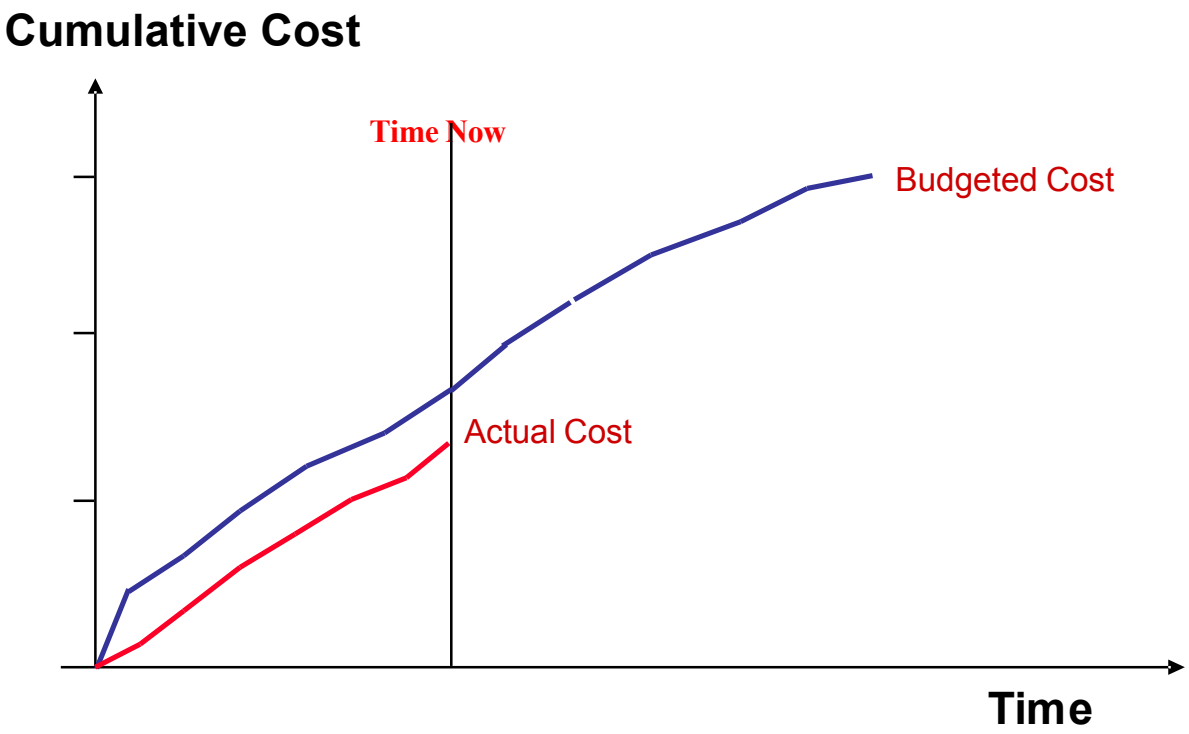

Figure 3. Actual and Budgeted Cost Curves

What do the curves in Figure 3 tell us about the project? In essence, not very much. To try to interpret the data, we can say that we have spent less than we intended to spend but does this mean that we are doing well or – working very economically or could it be that we haven't had enough resources to do what we had expected to do. What is missing is some notion of progress. So Figure 4 now introduces the subject of progress by associating the Budget curve with the amount of work that we expect to have carried out.

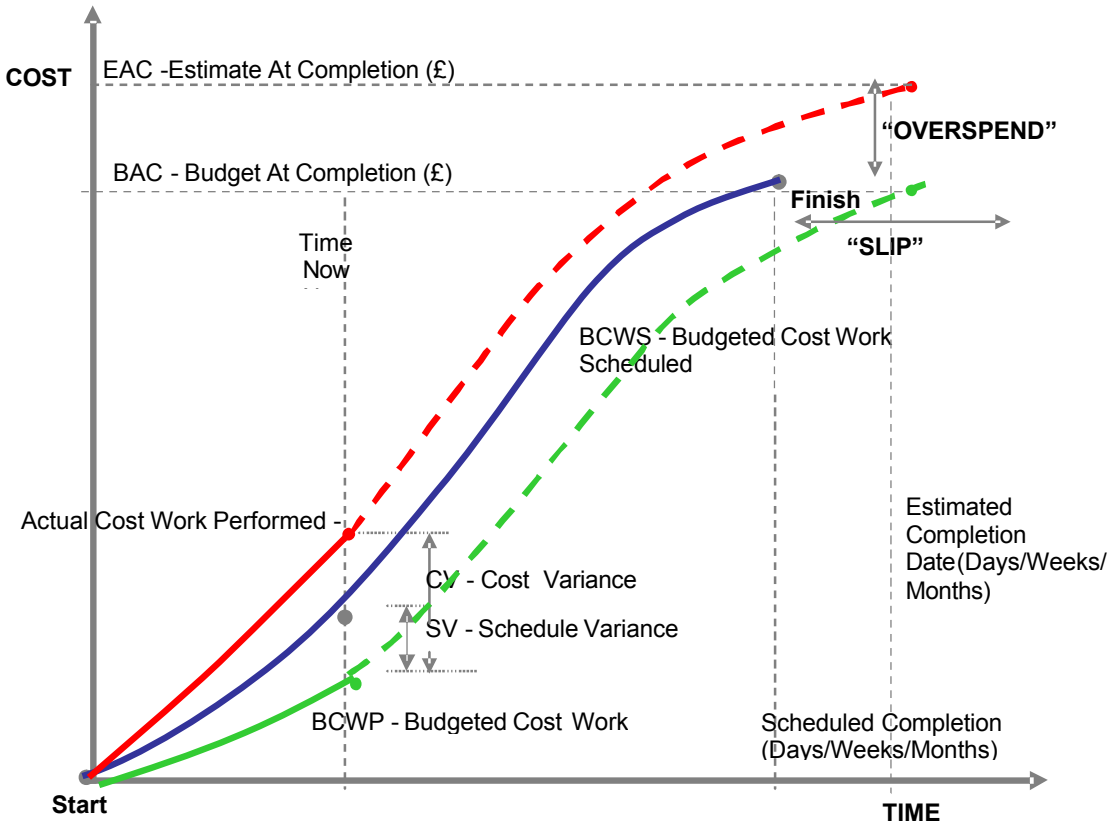

Figure 4 Earned Value Curve Set.

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Summary of Measurements and acronyms used in EVM

Variances in EVM

Schedule Variance (SV) = BCWP - BCWS (EV - Planned Costs)

If SV is positive project is ahead of planned progress, If negative project is behind planned progress.

Cost Variance (CV) = BCWP - ACWP (EV - Actual Cost)

If CV positive costs below budget, If CV is negative costs above budget.

Performance in EVM (measured as ratio)

Schedule Performance Index (SPI) = BCWP/BCWS or EV/Planned Cost

SPI <1 the project is slipping.

Cost Performance Index (CPI) = BCWP/ACWP or EV/Actual Cost

CPI <1 the project is overspending

To summarise:-

Earned Value is a measure of actual achievement

EV allows us to compare actual achievement with planned achievement

EV allows us to compare actual achievement with actual spend

EV allows us to determine whether we are behind or ahead of schedule

EV allows us to determine whether we are under or over cost

Some Examples

Look at Figure 5 below

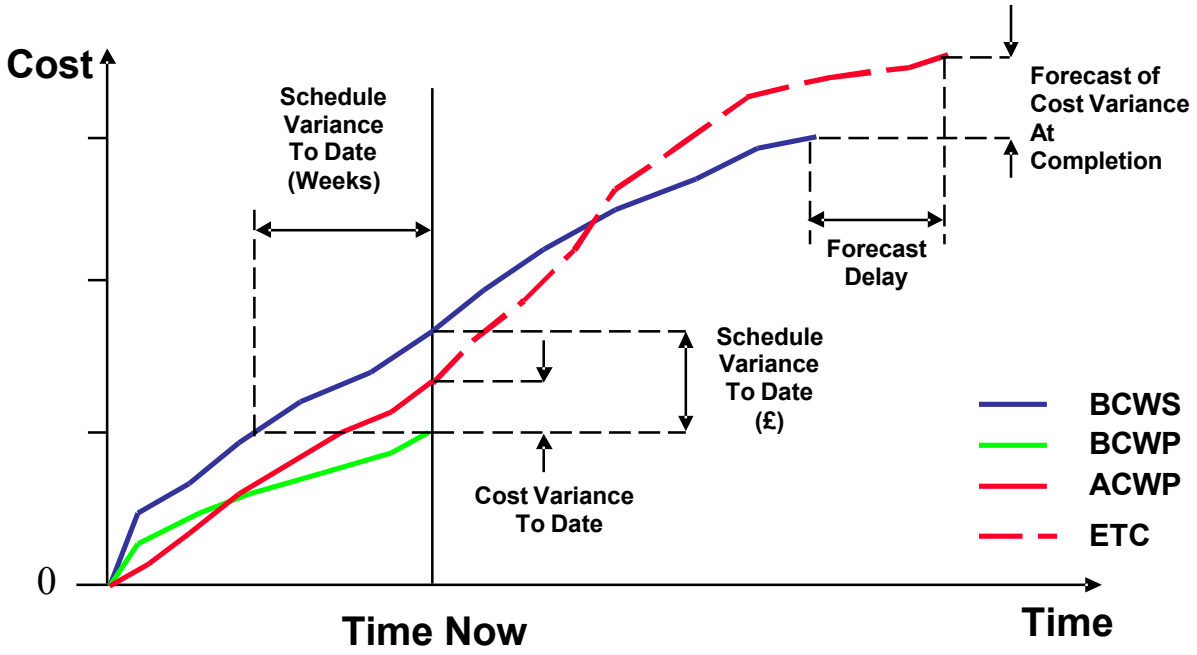

Figure 5 A Project Example of Earned Value

This Earned Value Curve tells us:-

We are behind schedule and getting further behind

We are over spending

NB. Actual Costs are less than Budget but greater than the Earned Value

The graph shows the current position at Time Now

The graph also shows the trends that lead to the current position

Now look at Figure 6

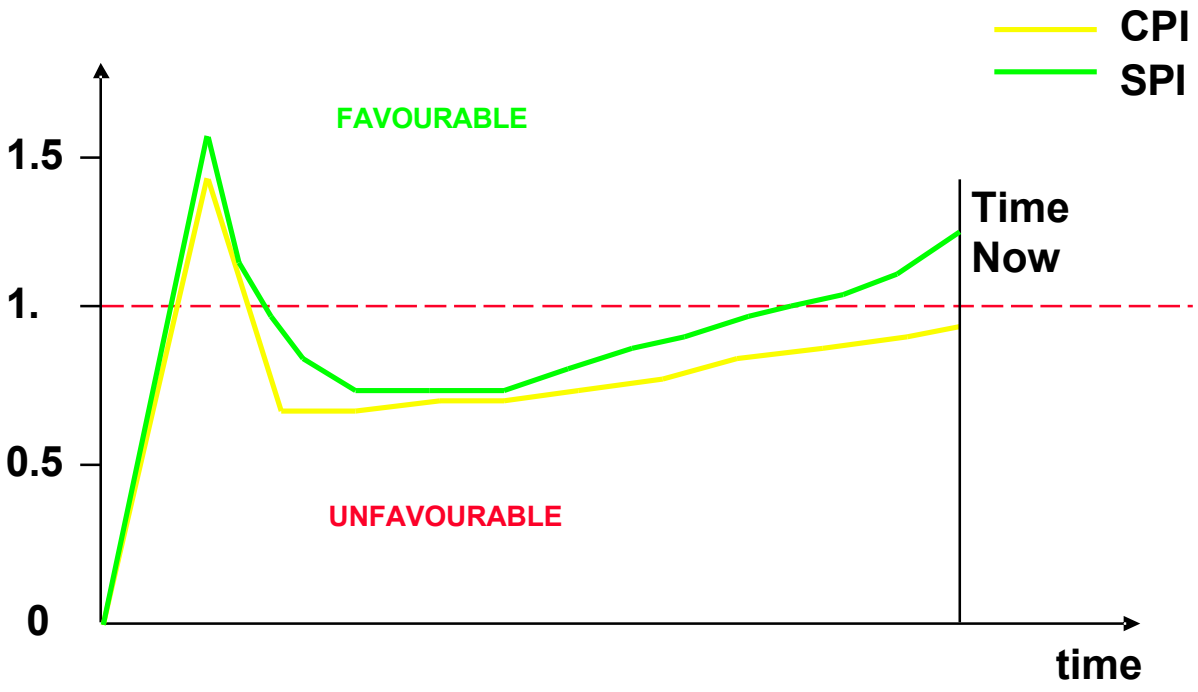

Figure 6 A Project CPI/SPI Curve

This CPI/SPI Curve tells us:-

We started very favourably but rapidly ran into an over spending behind schedule position

Over the following months the position improved.

We are currently slightly ahead of schedule but still over spending

Summary of Benefits of Earned Value Management

- Increased Project visibility
- Deflates Project Manager's Natural Optimism
- Provides Early Warning Of Problems
- Gives an Objective Basis for EAC
- Focuses Management Attention on:-
    - Overspends and Overruns
    - Variance Causes
- Helps to encourage Improved Estimating and Planning

Why Do Project Managers Resist the Use of EVM

As I have shown, there are benefits that come from the use of EVM but I still meet Project Managers who are unwilling to use EVM. Their reasons fall into two groups, those that they

are willing to speak about and those that I have been left to infer from behaviour and comments.

Quoted Reasons for Avoiding EVM

1. Too bureaucratic
2. Too expensive to implement
3. Too many people
4. Special IT Toolset needed
5. Baseline cannot be established early – development programmes have too many uncertainties
6. "This programme is too small to need such a tool"
7. We are only a small company and can't afford this
8. This programme is too big – EV is meaningless for us

Unquoted Reasons for Avoiding EVM

1. Objectivity leaves nowhere to hide
2. We have to do some detailed planning ahead of the game and are not willing to make this much effort
3. EVM will reveal more about actual costs to the Customer than we want to
4. We don't understand it and it looks too complicated

This paper has served to introduce my topic and my presentation at the Conference will focus on examples from projects of these issues and how they have been overcome.

FURTHER REFERENCES

APM Guide to Earned Value (UK)
NAO Website www.nao.org.uk
OGC Website www.ogc.gov.uk