Visual Control Methods of Project Management – S Curve and 4 D PCM Grid

By M Hariharan ©

In the last piece of article we elaborated on the QRST method of addressing Project Cost concerns. We introduced the concept of Earned Value Management (EVM) and the measures that are part of the EVM. In this part we shall be addressing two methodologies to track and act on Project Cost and Schedule concerns – S Curve and ***Savoir faire*** 4D Project Management Grid ©

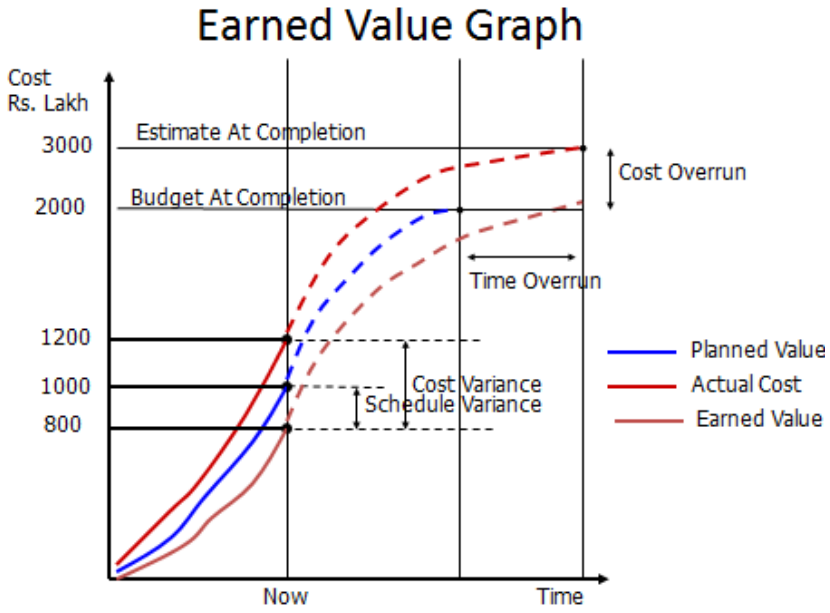
S Curve:

"Many natural processes, including those of complex system learning curves, exhibit a progression from small beginnings that accelerates and approaches a climax over time. When a detailed description is lacking, a sigmoid function is often used. A sigmoid curve is produced by a mathematical function having an "S" shape. An S-Curve is a sigmoid function, that is a mathematical process or function that results in a S shaped curve also called a Sigmoid Curve."

The S-Curve is used in project management to represent

a) various expenditures of resources over the projected time of the project,
b) real-time expenditure of resources
c) estimated progress of the project schedule
d) actual progress of the project schedule

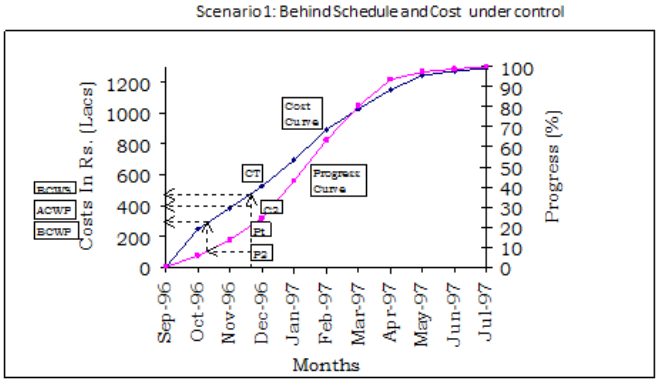
S-Curve is a tool of quantitative risk analysis which project management would use to determine the possible dangers of any given course of action in terms of cost and schedule variances. Figure given below is a typical example of and S Curve depicting all the key parameters of cost information – Estimate At Completion, Budget At Completion, Planned Value, Actual Cost, Earned Value, Cost Variance and Schedule variance.



Project Management using S Curve:

S Curve is a quite handy Visual Control Chart from tracking the Cost over runs and Schedule lags. The four scenarios of possible cost and schedule variances relating to a project of Jetty project are depicted here:

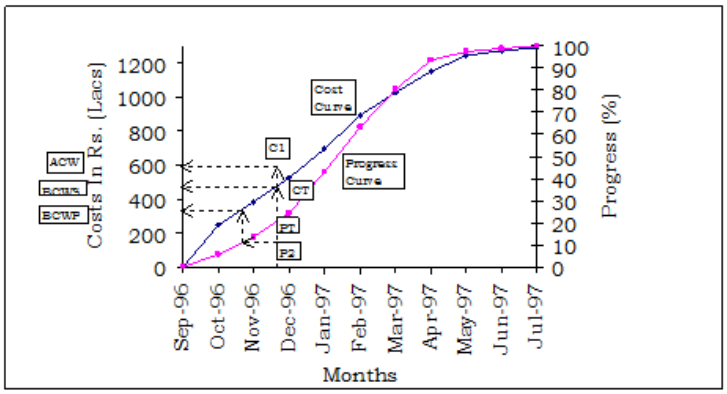
Scenario 1: Project is behind schedule (Pt vs. P2) while the cost is under control (Ct vs C2)



Trend Summary & Recommended Action:
•Possible lack of resources on some critical work fronts which is leading to less progress then planned.
•Advice identification & Augmentation of required resources.

Scenario 2: Project is behind schedule (Pt vs P2) and the cost is over run (Ct vs C1)

Scenario 2: Behind Schedule and Cost Over run

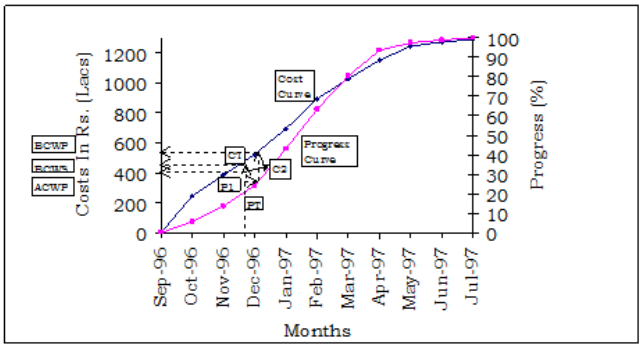


Trend Summary & Recommended Action:

- Productivity seems to be less than the norms or resources not being utilised properly.
- Both budget and schedule need to be re-examined. Intensive monitoring advised.

Scenario 3: Project is ahead of schedule (Pt vs P1) and the cost is under control (Ct vs C2)

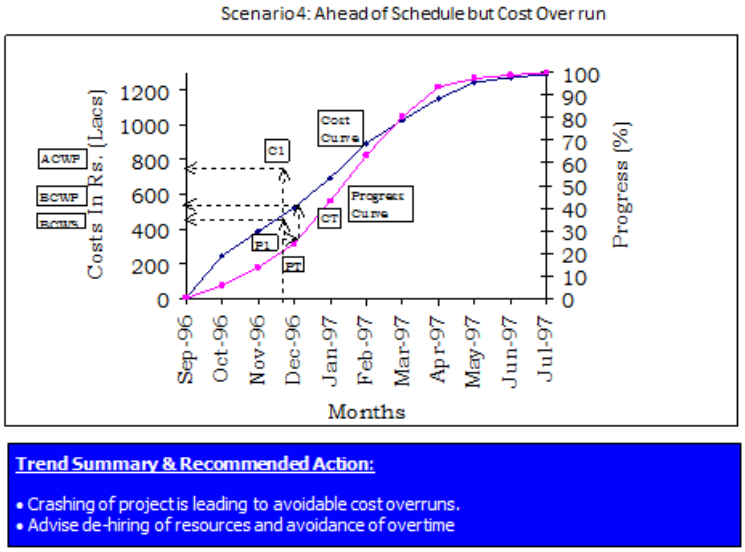
Scenario 3: Ahead of Schedule and Cost under Control



Trend Summary & Recommended Action:

- Most desirable scenario.
- Maintain trend to the extent possible.

Scenario 4: Project is ahead of schedule (Pt vs P1) but the cost is over run (Ct vs C1)



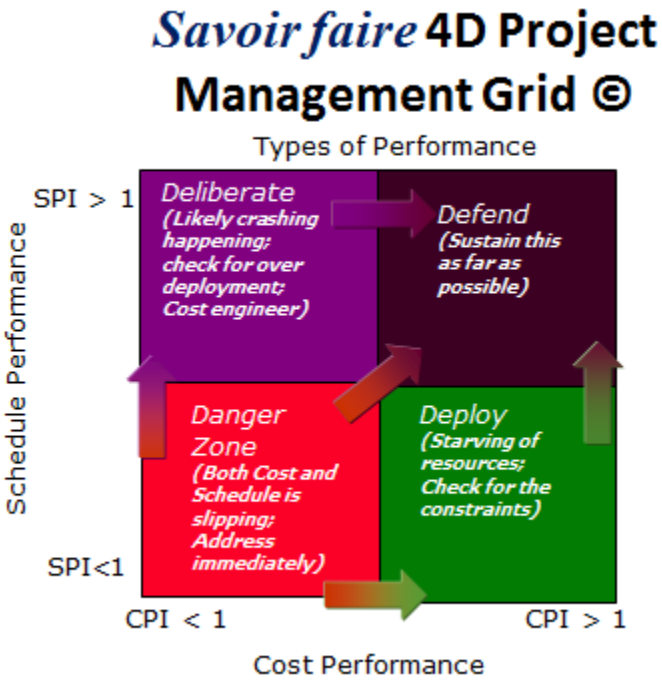
Trend Summary & Recommended Action:

- Crashing of project is leading to avoidable cost overruns.
- Advise de-hiring of resources and avoidance of overtime

Savoir faire 4D Project Management Grid ©

S-Curve is quite a powerful Visual Control Methodology for a project manager. However, with multiple projects handled simultaneously it is quite a task for a top manager to have a bird's eye view of all the projects. Similarly in the case of a large project with multiple WBS elements handled at the same time, it becomes quite voluminous for the Top manager to comprehend the total project.

To enable this *Savoir faire* 4D Project Management Grid © is pretty useful.



The X axis of the Grid represents Cost Performance and the Y axis represents the Schedule performance. The Schedule Performance Index (SPI) and the Cost Performance Index (CPI) relating to the multiple projects (in the case of multi-project company) and the SPI and CPI of

the various WBS elements in the case of the large project company are calculated. The CPI, SPI combinations are plotted on the Grid.

Scenario 1 of the S Curve given earlier, (Behind schedule, and cost under control) (SPI<1 and CPI>1) will be plotted in the Deploy quadrant of the 4D Grid. Any project in this grid triggers deployment of resources.

Scenario 2 of the S Curve (Behind schedule and Cost over run) (SPI<1 and CPI <1) will be plotted in the Danger Zone quadrant of the 4 D Grid. Any project in this grid calls for close monitoring by the senior management to get it back on track.

Scenario 3 of the S Curve (Ahead of schedule and Cost under control)(SPI>1 and CPI>1) will be plotted in the Defend quadrant of the 4 D Grid. Any project in this grid is in a very favourable state and efforts should be taken to ensure this remains in this quadrant.

Scenario 4 of the S Curve (Ahead of schedule but Cost over run) (SPI>1 and CPI<1) will be plotted in the Deliberate quadrant of the 4 D Grid. Management has to apply their judgment on these projects. For example if it is a Build-Operate-Transfer project or a project with incentives for early completion may be allowed to go in the same vein; alternatively in case the project has cost as a critical driving factor, then it may be made to slow down to ensure cost is brought back to the budget level by slowing the project. Management has to deliberate on the possible actions.

4 D Grid gives a macro perspective to the top manager. This is a power Visual Control mechanism for Project Management. This is NOT A REPLACEMENT of the S Curve, but works very well in conjunction with the S Curve. S Curves for the Danger Zone and Deliberate projects will be the focus areas for the top management.

To Conclude

Any tool is as good as the user and the context of usage. S Curves gives a specific focus on an individual project or a WBS of a larger project; where as 4D Grid gives a macro picture of all the projects or all WBS elements of a larger project. They can be used in conjunction. They are not mutually exclusive methodologies, but related Visual Control Methods to provide both macro and micro perspective.

About the author:

M Hariharan practises consultancy in the field of cost management, lean thinking, constraint management, management control system and business excellence as Founder Director at Savoir Faire Management Services. Savoir Faire helps organisations to improve their profitability by aligning their people and processes to customer value and articulate the bottomline impact using the cost excellence (CE©) model.
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