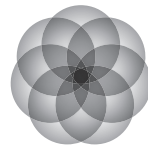# // Baseline Compliance Analysis

A True Measure of How Well a Project is Performing

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Introduction

This paper describes a technique for determining how well a project is performing relative to an agreed upon plan (often known as a baseline). Overcoming some of the limitations of traditional performance tracking, this new approach puts an emphasis on identifying how much variance from the plan occurs over time. Further enhancing this valuable insight, is the ability to also apply this analysis technique to different groupings or sections of a project and determine which of these best complies with the project plan. In summary: this approach allows for a quick determination as to whether your project is being executed as planned, and if not, where the areas and time periods of non-compliance are.

The technique is applicable to both project execution as well as post-execution for firstly keeping the project on-track and secondly for determining lessons learned as well as a powerful means of understanding root cause of project delays during a project forensics exercise.

Traditional Project Performance Techniques

There are numerous techniques for tracking the performance of a project: that is "how well is the project being executed relative to a given plan of work?" This can be relative to project expenditure or project schedule or even quality of the project deliverable.

Percent Complete

The most simplistic measure of performance or status is to track projects using what is known as *percent complete*. While there are many variations around the calculation of percent complete, the basic premise is to track performance by determining how much work, progress or time relative to a given quantity has been achieved.

While a common technique, it is widely seen as falling short with regards to true performance tracking as it does not give any indication as to the context of the progress. For example, if an activity is 90% complete, it cannot be determined from this metric alone whether performance is good or bad – the activity may be very close to completion but months later than expected.

Earned Value & Earned Schedule

Earned value is a cost-based measure that compares three bases (planned, earned and actual) within a project so as to determine relative performance indicators. By comparing how much work or progress has been achieved (earned) with how much *should have* been achieved (planned), and additionally with how much it took to achieve

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this status (actual) we are able to determine performance factors and ratios that give insight as to whether performance is better or worse than planned.

Unfortunately, earned value is a cost-based measure only and the effort required to capture the data for the three bases can be seen as a drawback to this method.

For those projects that are wanting to track *schedule performance* using an earned value-type approach, there is the option known as *Earned-Schedule*. Similar to Earned Value, earned schedule looks at how much progress has been achieved (earned) relative to how much was planned, with regards to the schedule.

While earned schedule provides schedule-based performance insight it suffers from a shared issue also found with earned value. Neither Earned Value nor Earned Schedule actually enable us to determine how close to the (baseline) plan did the execution of the project actually fall. Instead these two techniques focus on execution *efficiency*. Net efficiency on a project may calculate at 100% but what if the sequence of work was executed completely out of sync from the plan, for example?

So you may be wondering "so what if the sequence of execution was not to plan or so what if half the activities were delayed and the other half were early – the net result was a successful project right?" Wrong… The whole purpose of project management is to set a realistic plan and then use this plan to accurately track execution through to completion. If compliance to the plan is not upheld then the likes of delays, disputes regarding payment milestones, potential litigation surrounding cause and effect of change all become too commonplace in a project. These "To-be-avoided pitfalls" are the reason behind using baseline compliance analysis.

Introducing Baseline Compliance Analysis

Baseline Compliance Analysis compares (on a per-period basis) what was originally planned and what is actual reality in the current schedule. By examining variance surrounding activity *starts* and *finishes* relative to a given basis (baseline), this approach provides insight as to whether the project is being executed to plan or alternatively suffering from delayed starts and/or delayed completions.

A fundamental aspect to the analysis is that the comparison is not simply a "is the current activity date later than it's corresponding baseline date?" Instead, phases or periods of time are used as thresholds to capture whether an activity is early, late or on-time. For example, if running an analysis based on months on an activity that was scheduled to start on March 5th and didn't start until March 31st, this activity would still be classified as "starting on time" within the context of the monthly reporting cycle.

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Figure 1 shows the 5 different outcomes from a baseline compliance analysis for a single activity. These are all measured using start and finish variance.
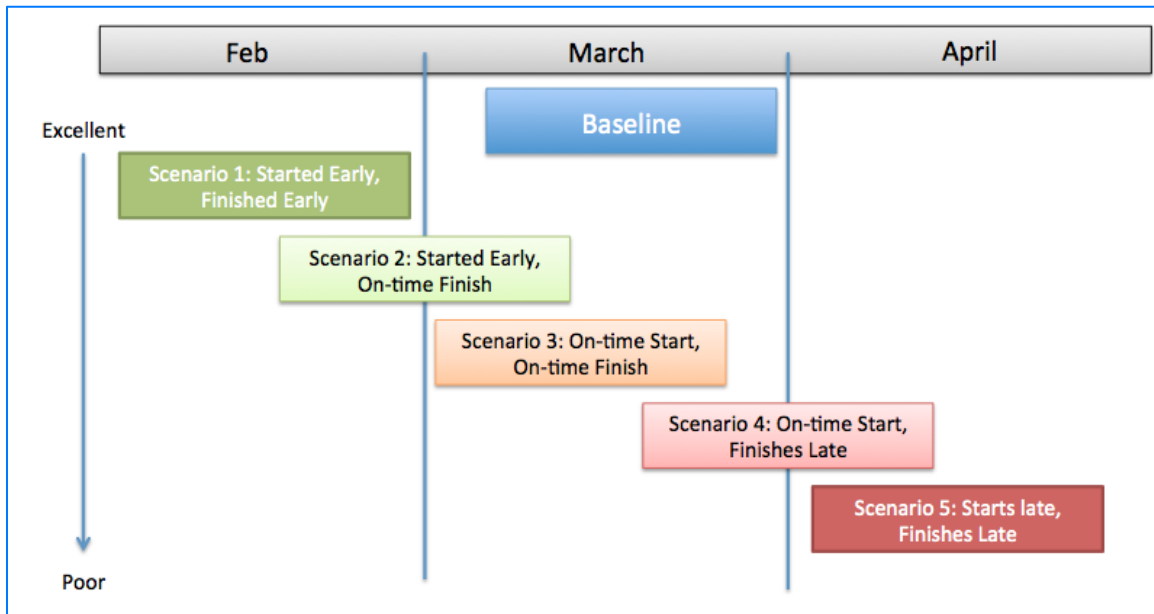

Figure 1 – Early, On-Time, Late Scenarios

The results of the baseline compliance analysis are then summarized using compliance metrics:

- **Start compliance** is a measure of how many activities start on time relative to a given baseline (within the confines of a given phase such as months). This gives insight into the knock-on effect of previous period delays. If start compliance is low, then few activities are able to start on time due to their predecessors causing delay.
- **Finish compliance** is a measure of how many activities finish on time relative to a given baseline (within the confines of a given phase such as months). This is a strong indicator of execution performance.

How Is Baseline Compliance Measured?

Consider a baseline schedule as shown in Figure 2. The schedule contains ten activities. There are two paths through the network.
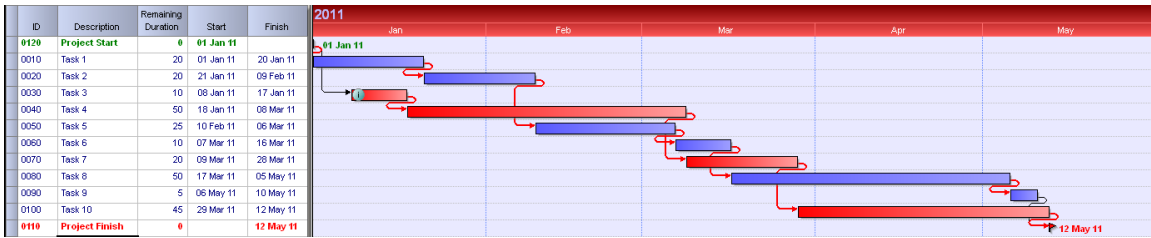
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Figure 2 – Example Schedule

Firstly, metrics pertaining to the baseline are calculated so as to create a basis:
1. Scheduled to Start: # of activities scheduled to start in a given period
2. Scheduled to Finish: # of activities scheduled to finish in a given period

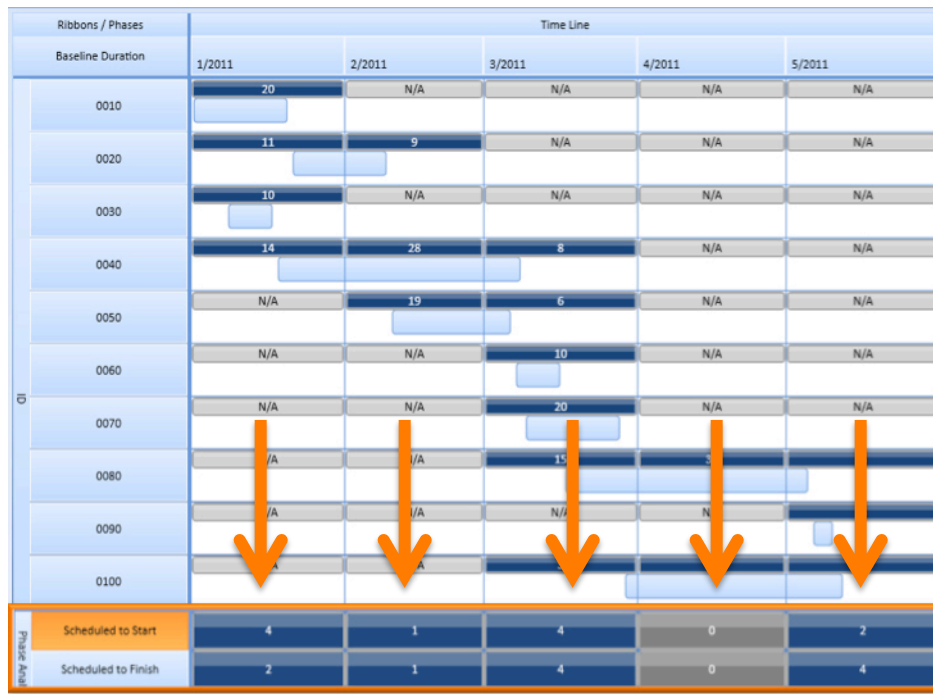Figure 3 shows these two metrics applied to each monthly period.

Figure 3 – Metrics Applied to the Baseline Schedule

Figure 4 shows how the two scheduled to start/finish metrics vary per month. Interestingly, while several activities span the month of April (Figure 3), none are planned to either actually start or finish in this month (Figure 4).
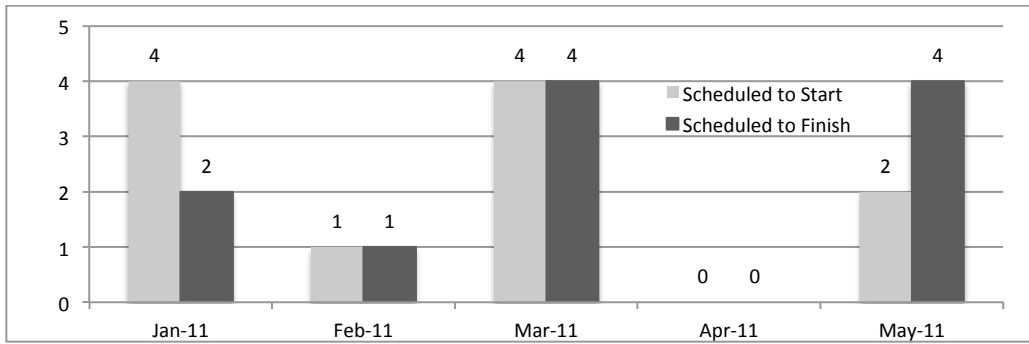
Figure 4 – Baseline Metrics Applied to the Schedule

Now consider an updated version of the schedule created during execution. Changes have occurred with regards to the sequence, duration and dates of the activities in the schedule. This results in a schedule very different to the baseline (see figure 5).
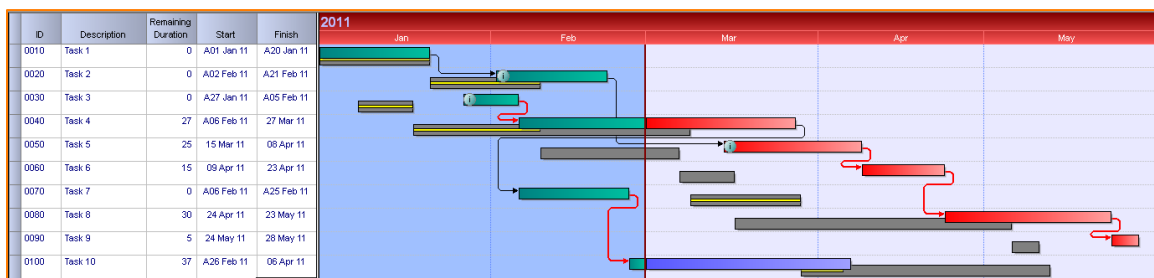

Figure 5 – Updated, Statused Schedule Showing Baseline Comparison

When the equivalent metrics for number of starts and number of finishes are applied to the updated schedule so as to calculate early, on-time and late starts and finishes, the result is very different (Figure 6).
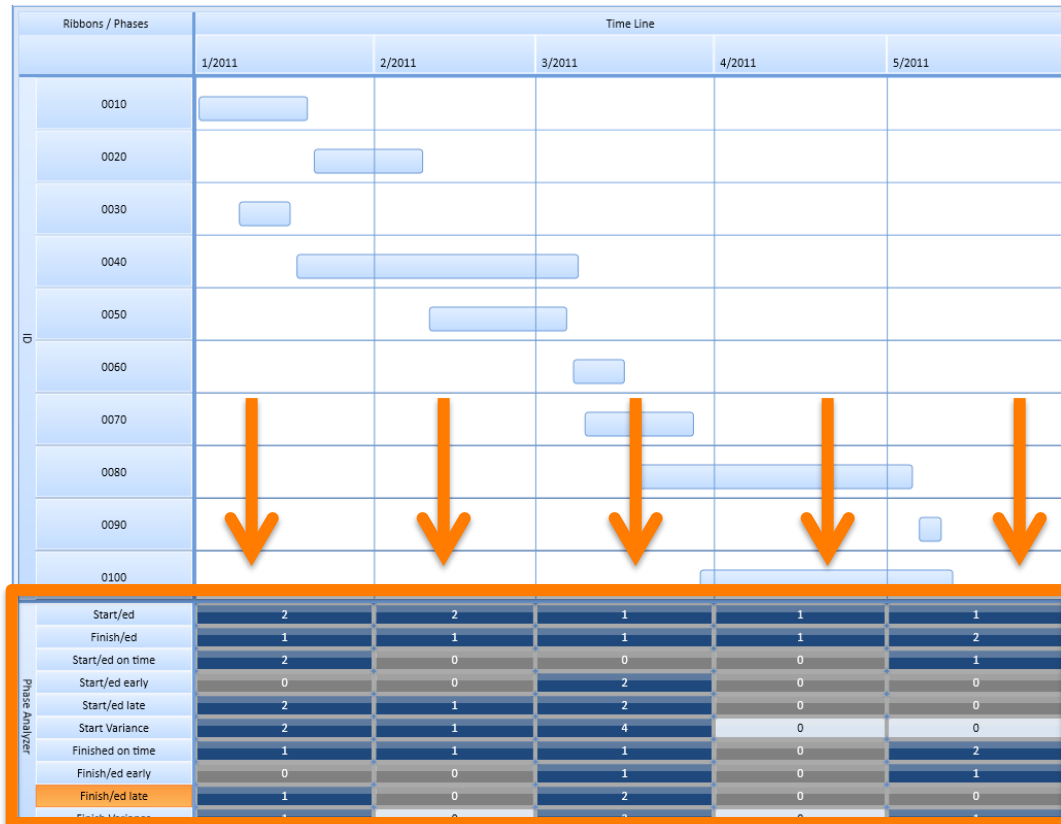
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Figure 6 – Metrics Applied to the Actual Schedule

Once the metric analysis has been completed, Baseline Start and Finish Compliance can quickly be calculated as a percentage of activities that uphold the baseline (i.e. those activities that don't trigger a start or finish variance). Figure 7 shows a summary of these results.

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Group	Metric	Jan-11	Feb-11	Mar-11	Apr-11	May-11	TOTAL
Baseline	Scheduled/Baselined to Start	4	1	4	0	1	10
	Scheduled/Baselined to Finish	2	1	4	0	3	10
Updated Schedule	Start/ed	2	4	1	**2**	1	10
	Finish/ed	1	3	1	**3**	2	10
Statistics	Start/ed on Time	2	0	0	0	1	3
	Start/ed Early	0	0	2	0	0	2
	Start/ed Late	2	1	2	0	0	5
	Finish/ed on Time	1	1	1	0	2	5
	Finish/ed Early	0	0	1	0	1	2
	Finish/ed Late	1	0	2	0	0	3
	Start/ed on Time, Finish/ed Late	0	0	1	0	0	0
Compliance	Start Variance	2	1	4	0	0	7
	Cum Start Variance	2	3	7	7	7	
	Start Compliance	**50%**	**0%**	**0%**	**N/A**	**100%**	**30%**
	Finish Variance	1	0	3	0	1	5
	Cum Finish Variance	1	1	4	4	5	
	Finish Compliance	**50%**	**100%**	**25%**	**N/A**	**67%**	**50%**

Figure 7 – Compliance Calculations

Multiple conclusions can be drawn from Figure 7:

- Start compliance started off at 50% in January and continued to slip through to the last month of the project.
- Finish compliance actually improved to perfection in February (100%) before massively falling behind in March (25%)
- Overall start compliance was only 30% compared to overall finish compliance of 50%. This shows that while start compliance was low, the project actually finished more activities 'on-time'
- April was forecasted as a month with no starts and no finishes and yet it actually experienced 2 unplanned starts and 3 unplanned finishes.

When start and finish variance is plotted on a cumulative timescale (Figure 8), it can be seen that the start variance is getting worse at a faster rate than finish variance. Hence, the project is showing signs of being able to complete closer to on-time despite an increasing number of start delays.
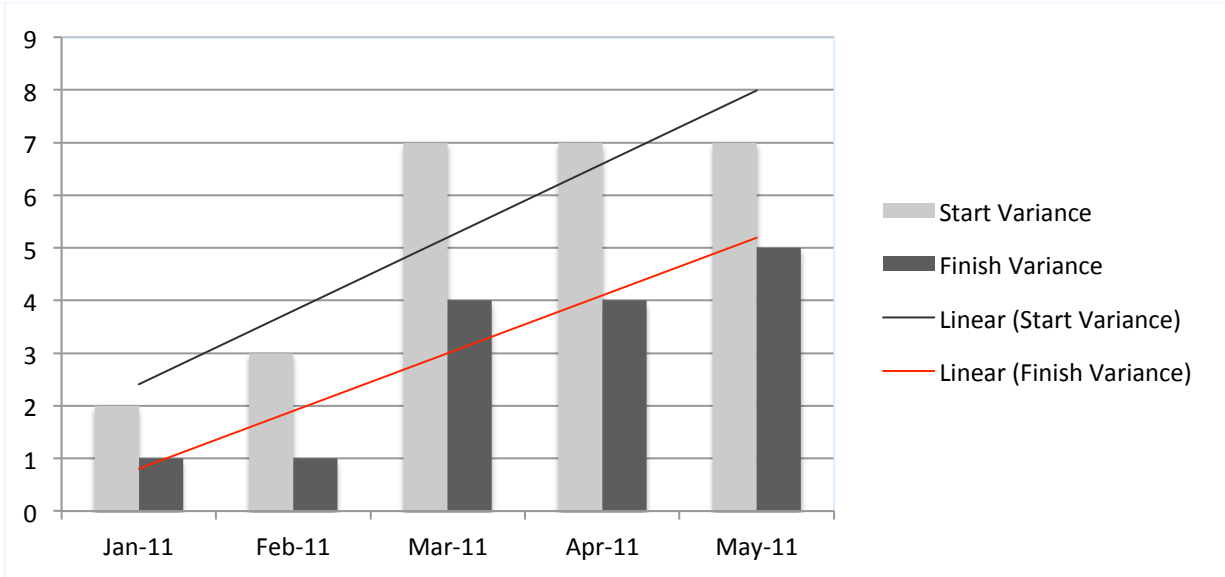
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Figure 8 – Compliance Trending

Conclusion

Baseline compliance is an effective means of determining how well a project is able to perform relative to a given baseline. By determining the number of activities that either start or finish within a given forecasted range, we are able to get a better understanding as to where and when compliance is falling short. Once this insight is gained, we then have a much better chance of proactively focusing on those activities that require remediation and acceleration. Looking at baseline compliance over time and by WBS groupings gives even further insight into schedule hotspots and performance bottlenecks.

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