White Paper 2016-01

How to Check the Quality of an Integrated Project Schedule – part I: On the Schedule Print-Out

One of the key skills of a Project Manager should be to be able to vet the quality of schedules produced by his team. In this two-part White Paper we give important clues that allow to quickly assess whether the technical quality of the schedule is sufficient. In this particular White Paper we discuss those clues that are already available on the print-out version, without even having to dive into the scheduling software. White Paper 2016-02 in turn will deal with checks done in the scheduling software itself.

Important note: *the content of this White Paper is only strictly applicable to project execution schedules. Feasibility study or tender schedules may not be built following the same rules for the following reasons:*

- *Detail of activities unknown or assumed in some areas, replaced by placeholders*
- *Logic of the schedule might be different, e.g. schedule built from the delivery date backward to assess a required start date, utilization of positive or negative lags to avoid detailing, etc.*

What all Schedule Printouts Should Show

All Projects should have a standard way of presenting schedules. At Project Value Delivery, we recommend all schedules bar-chart (Gantt chart) printouts to include the three following information for each activity (in addition to the usual information such as activity ID, start date, finish date, duration and name):

- The Total Finish Float as a column,
- The baseline activity schedule as a line underneath the updated activity bar,
- A specific identification of the activity sequence defining the Critical Path.

Schedule Correctness Checks

Schedule Balance Between Functions

The Integrated Project Schedule should be balanced between main functions (Engineering – Procurement – Construction – Commissioning). Whether or not it is the case is a very simple test for the maturity of the schedule. Very imbalanced schedules will certainly fail to qualify for proper Integrated Project Schedules.

We are always astonished to be called in to review Projects only to find out that they have, for starters, a poor schedule.

Total Finish Float

The Total Finish Float is the total amount of time an activity can be delayed without impacting the Project finish date (it is different from the free float which only measures by how much an activity can be delayed without impacting the start of the successor activity). It is a good measure of the 'slack' that the Project Manager has on this activity from the overall Project perspective.

Total Finish Floats are extremely useful because excessively high values (as a guideline, over 100 days on a multi-year Project) or awkward values will hint directly at lack of linkages within the schedule. If an activity has no successor the program will simply calculate the Total Finish Float as the difference between the activity finish date and the Project's end date!

It is thus very easy by looking at the Total Finish Float column in the printout to have quick check of the quality of the work of the Project planning team. A well-built schedule should show consistent values that should remain relatively low.

Baseline vs actual or forecast

Comparing the baseline and the latest actual or forecast schedule of an activity is extremely valuable and it is amazing how few organizations do require this to be shown systematically on their schedule print-outs (maybe because of the unbearable discomfort of showing the slippages compared to the original plan!). It is an excellent visual cue of how the Project is unfolding compared to the baseline plan.

From the technical perspective, it is an excellent indicator of the quality of the schedule update. If too many activities stick to the baseline schedule, it probably means that the update and forecast processes do not work properly. If that is the case mainly for future activities it shows that the forecasting is not effective and that there might be some links missing, in particular if the current actual work deviates from the baseline at the same time.

Critical Path

While it should be a basic check, it is sometimes overseen. A proper schedule should of course have a Critical Path, i.e. the sequence of activities that adds up to the longest overall duration and thus drives the Project completion date.

The Project Manager's focus should of course normally be on those critical activities because any delay will impact the completion date (and any early finish will create opportunities).

Checking whether the Project schedule effectively identifies a Critical Path is another good check that the schedule is properly linked. Critical Path activities are generally identified by the colour red on a schedule print out.

A lack of Critical Path shows that the schedule is not properly linked (in particular regarding the end activities of the Project) and probably uses too many internal date constraints. In any case it is not a sound schedule to be

used for decision-making at Project management level. Request the planning team to revise.

Schedule Realism Checks

Once Project schedules have been checked technically and logically, it is important to also check the soundness of the information that is included, with regard in particular to the estimated duration of activities.
This requires the knowledge from people of the trade. In mature Project organizations, databases of actual data from past Projects will be available for benchmarking, possibly with some formulas for scaling when relevant. Suppliers and contractors will include time estimates in their bids that can be used as a basis for parts of the schedule (however, they need to be carefully challenged because delivery lead time is a competitive parameter, hence those proposed durations need to be reviewed against benchmarks and the inclusion of an additional allowance is often necessary). Finally, for activities that have never been carried out before, expert knowledge can be mobilized and documented (as well as the related uncertainty).

All Projects should have a standard way of presenting schedules print-outs with valuable information that allows instantly to determine its quality.

Main Traps of Estimating

- Failure to document the estimates' source
- Failure to challenge the experts' durations
- Issues with schedule resourcing
  - Resourcing needs to be done based on proven benchmarks
  - Resource-levelling in case of resource constraints needs to be treated with a lot of caution and needs to be done manually.
  - If you don't change your project completion date, resource levelling due to resource availability limitations will diminish the overall available float.
  - Adding resources does not necessarily imply a significant shortening of Project duration.

Useful Check Points for Project Schedules' Realism

- Checks for the entire schedule duration. A Project schedule should fit in the existing benchmark of similar Projects.
- Checks for key holiday periods, in particular for global projects where it is difficult to include all the holiday periods in the schedule

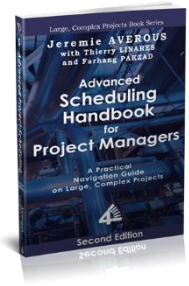
Specific checks apply for schedules that are resourced:

- resources utilization vs overall resource availability (for critical trades)
- Resource density limitations on the worksite
- Resource mobilization and demobilization curves where a rule of thumb of maximum variations 15% of the total manpower per month is applicable

Conclusion

We are always astonished to be called in to review Projects only to find out that they have, for starters, a poor schedule. Poor in the sense of poorly linked, not representative of the work to be done, or unhealthily unbalanced between the types of activities that have to be performed.
Setting up an adequate route map at the onset of the Project should be the utmost priority of the Project Manager. Unfortunately, this does not always happen, either because of work overload or of a lack of competency from the Project Manager. This White Paper provides Project Managers and other senior Project personnel with straightforward ways to challenge a schedule to get it improved to a point where it can be realistic and useful.
In all cases, before sailing away, make sure to have a proper map of the right quality in hand!

Find all these principles of Advanced Scheduling exposed in a comprehensive manner in our Handbook,
Advanced Project Scheduling for Project Managers
(2nd edition available in Paperback and Kindle versions!)



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