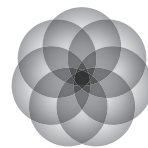# // Developing Standards for Enterprise Schedule Quality

Tom Polen

Director Professional Services, Acumen

November 2012

ACUMEN
Proven Project Analytics

Table of Contents

ACUMEN
Proven Project Analytics

Developing Standards for Enterprise Schedule Quality

Project-oriented organizations must approach quality from all angles—from the planning process to execution, and ultimately, through customer satisfaction. The need for quality is a constant, guiding force. However, as thousands, perhaps millions, of companies can attest, while quality is not necessarily expensive in the traditional sense, it can be difficult to obtain and an absence of quality can be costly and potentially fatal for a company.

Enterprise schedule quality refers to the soundness and reliability of a project schedule and is essential to successful project execution. Schedule quality is a direct indicator of whether a plan is realistic and achievable.

The Integrated Master Schedule (IMS) is the cornerstone of the planning and execution process, and is only as strong as its weakest link. There can be many contributors to the IMS—your own plans may involve a single company, hundreds of suppliers, or somewhere in between. Poor quality in any area of your plan can undermine successful execution by creating an unrealistic view. In fact, erroneous or low quality data, once present in the IMS can immediately begin a degradation process, which ultimately obscures the true execution-impacting events from plain sight. When truly critical activities are viewed as insignificant or time-insensitive, predicted execution can unravel.

Ensuring quality in the IMS can be achieved through a three-step process

1. Define quality standards for the IMS.
2. Communicate the standards
3. Continually 'raise the bar' to bring higher overall maturity

Quality in the details of project planning and execution drive the overall effectiveness of your organization. Your company is ultimately defined by the work that you perform. Work that is performed to high quality standards by a mature organization will be rewarded by customers in the form of loyalty and industry recognition.

A Framework for Schedule Quality

Through a five-stage, four step process you can improve the quality of your schedule. Each stage of this framework furthers a schedule's maturity resulting in a schedule that is:

1. Structurally sound: well built using appropriate CPM scheduling techniques

2. Realistic: accounting for known scope as well as unknown potential risks and opportunities.

3. Optimized: thoroughly reviewed for potential cost/schedule acceleration candidates.

4. Validated: buy-in obtained from the project team, subject matter experts and the management team for the project.

If all four of these objectives can be achieved, then project stakeholder expectations will be aligned, the true scope of execution understood, and an achievable target against which the project can be tracked will be attained. In short, a sound basis of schedule will be

ACUMEN
Proven Project Analytics

accomplished thus overcoming one of the biggest project management challenges today: poor and unrealistic planning.

S1 //	S2 //	S3 //	S4 //	S5 //
The Base Schedule	Critiqued	Risk Adjusted	Optimized	Team Aligned

Figure 1 - Five Stages of Schedule Maturity

Figure 1 shows the five stages of schedule maturity. The process begins with a non-validated schedule developed using a Critical Path Method (CPM) scheduling tool. A schedule at S1 has questionable realism and often a flawed framework.

An S2 schedule has undergone a quality analysis process and improvement. At this stage, the project team has identified any troublesome areas of the schedule and made corrections. Stage 3 accounts for risk and uncertainty, weighing the impact of the 'known unknowns' that could arise during project execution.

S4 and S5 involve optimizing the plan to help meet stakeholder objectives and goals and incorporating team input to ensure that they are 'bought in' to the new optimized schedule.

Using metrics and agreed upon standards is helpful in assessing a project's maturity at any stage of the framework.

Structuring Maturity Goals

Commitment to achieving higher levels of maturity must persist at all levels of the organization, from functional positions through to the CEO and board of directors.

Maturity cannot be purchased or developed overnight. Achieving higher maturity is a long-term strategic process. However ultimately, it will be attained through a series of short, mid, and long-term activities.

Here are examples of short, mid, and long-term goals you may wish to consider:

Short-Term Maturity Goals

- Start the maturity development process itself—a step toward higher maturity
- Identify a project candidate for piloting the revised quality standards
- Communicate the importance of higher maturity throughout the organization
- Schedule frequent reviews to determine if the quality metrics and supporting analysis processes are helping to drive improved quality.

Mid-Term Maturity Goals

- Expand the pilot to include a variety of projects, small, medium and large
- Weigh the quality criteria of larger programs versus those of smaller programs

ACUMEN
Proven Project Analytics

- Assure that a common quality language can be used across programs of all types and sizes
- Keep senior management informed of successes, failures, and the evolution of the roadmap toward higher quality
- Quantify the real financial cost of failures in quality; your real examples will become your own customized case study used to justify the return on the investment in quality

Long-Term Maturity Goals

- Review accomplishments which promote higher maturity annually
- Assess ongoing resource requirements
- Ask yourself – Is the maturity "buzz" still in the air? What activities can keep the organization focused on quality and maturity?

Practical Implementation of Scheduling Quality at the Enterprise Level

Every aspect of project execution can benefit from higher quality. For this reason, quality improvement is a multi-stakeholder exercise, requiring participation from all project stakeholders, including customers and suppliers.

By using Acumen Fuse to create a metric template, discussions can begin as to which metrics should be used to measure schedule and project execution quality.

Figure 2 - Using Metrics to Meet Goals

ACUMEN
Proven Project Analytics
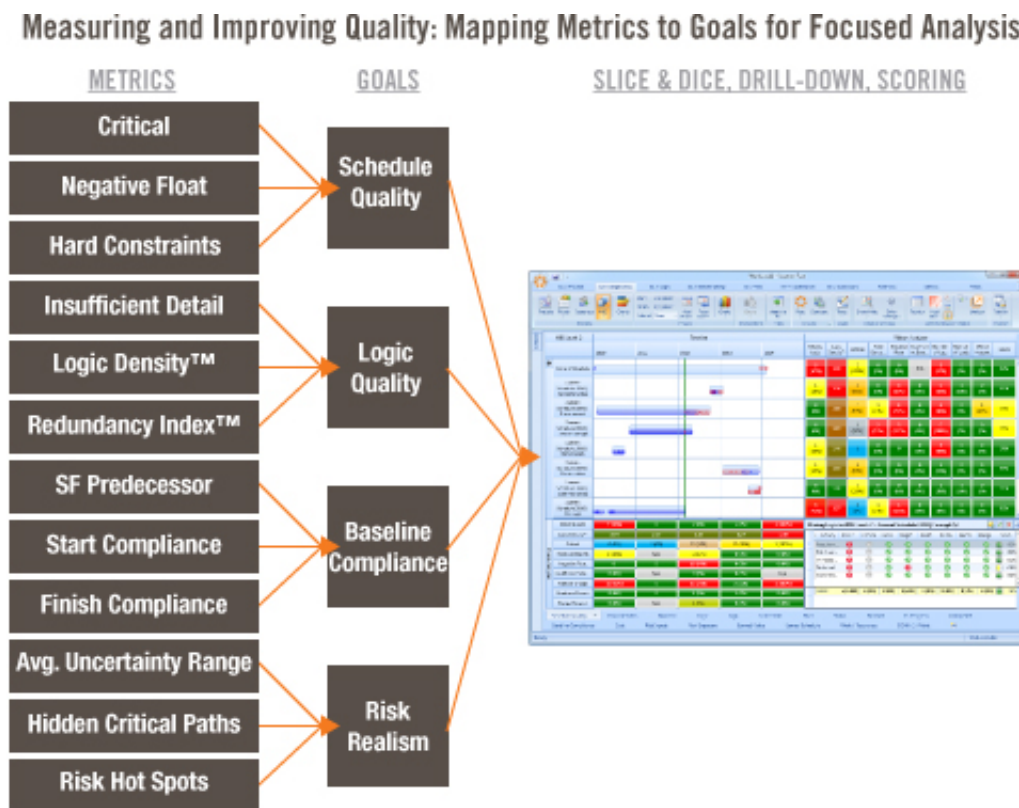
The most critical elements for mapping metrics to enterprise quality goals are:

- Determine quality attributes – e.g., schedule quality, logic quality, float, baseline compliance
- Select metrics to support the quality attributes
- Select thresholds and scoring method
- Group metrics in context by associated quality attribute so that the aggregate scores are meaningful quality indicators

Some of the most popular and prevalent quality checks are:

Missing Logic: A core schedule quality check. In theory, all activities should have at least one predecessor and one successor associated with it. Failure to do so will impact the quality of results derived from a time analysis as well as a risk analysis.

Negative Float: Negative float is a result of an artificially accelerated or constrained schedule. Negative float indicates that a schedule is not possible based on the current completion dates. Ideally, there should not be any negative float in the schedule.

Logic Density™: In theory, this value should be at least two. An average of less than two indicates that the schedule should be reviewed and updated with additional logic links. An upper limit of four is also recommended – logic density above this threshold indicates overly complex logic within a schedule.

Redundancy Index™: The Redundancy Index identifies overly complex logic caused by extraneous logic links.

Insufficient Detail™: Activities with a high duration relative to the duration of the project are generally an indication that a plan is too high level for adequate planning and controls. Consider further developing the schedule by adding more detailed activities.

SF Predecessors: Start-to-Finish (SF) links should be used very rarely. Having a successor activity happens before the predecessor activity is generally a poor practice when planning.

Start Compliance: Start Compliance calculates the percentage of activities starting or that have started outside the expected baselined period relative to the baselined activities starting or that should have started within this period.

Finish Compliance: Finish Compliance calculates the percentage of activities finishing or that have finished outside the expected baselined period relative to the baselined activities finishing or that should have finished within this period.

ACUMEN
Proven Project Analytics

Risk Hot Spots: The combination of multiple successors and high criticality combined typically result in a highly complex and risk-prone hotspot within a schedule.

Hidden Critical Paths: Hidden Paths is one of the most powerful risk exposure metrics. It shows those activities that have a high criticality (how often the task is critical) that in absence of risk do NOT fall on the critical path. If an activity has a high Hidden Path score, it should be considered as important as an activity that is critical.

Testing and Benchmarking

Prior to a pilot, scenario testing may be desired to benchmark the metrics themselves. Are certain metrics always failing the tests? Are the scores so high or low that they are not providing constructive information for quality improvements? Metrics should be calibrated according to both the quality result and the overall pursuit of maturity. For example, if a small company with relatively immature processes sets the quality standards too high, they may eventually feel that the standards are unachievable and abandon the pursuit of higher maturity. This is why goal setting for short, mid, and long-term is an essential part of the process. The definition of goals calibrated to each specific maturity level will help ensure that measurements will lead to near-term achievable improvements.

As the team matures and becomes satisfied with results for their current level of maturity, the goal can be raised and the challenge increased.

Typically, a mid-size or large program may the best candidate for a pilot. With sufficient resources, multiple concurrent pilots may be desired.

Attributes of an ideal pilot program candidate include:

- a highly visible program;
- a progressive, advanced project team team;
- external contributors to the schedule –i.e., subcontractors; and,
- a program manager and customer that are focused on quality.

A quality pilot program brings increased responsibility to the project team. If quality metrics are properly calibrated to drive higher maturity, not all areas of the schedule will pass the quality criteria each month. It is essential that quality breaches are treated as constructive opportunities rather than punitive events. Recognizing areas that proactively drive quality improvements is far more beneficial than emphasizing instances of failure. If improvement is not celebrated and failure is punished, the quality improvement efforts will become increasingly unpopular.

ACUMEN
Proven Project Analytics

| Ribbon Analyzer | | | | | | | | | |
Missing Logic	Logic Density™	Critical	Hard Constraints	Negative Float	Insufficient Detail™	Number of Lags	Number of Leads	Merge Hotspot	Score
2 (67%)	1.00	2 (67%)	0 (0%)	0 (0%)	N/A	2 (67%)	0 (0%)	0 (0%)	82%
5 (83%)	1.83	2 (33%)	1 (17%)	1 (17%)	0 (0%)	1 (17%)	2 (33%)	0 (0%)	75%
0 (0%)	2.83	3 (50%)	2 (33%)	1 (17%)	0 (0%)	6 (100%)	1 (17%)	0 (0%)	79%
1 (10%)	1.90	5 (50%)	0 (0%)	0 (0%)	0 (0%)	6 (60%)	0 (0%)	0 (0%)	93%
0 (0%)	2.00	5 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (20%)	0 (0%)	0 (0%)	98%
1 (13%)	2.50	5 (63%)	0 (0%)	0 (0%)	0 (0%)	1 (13%)	0 (0%)	0 (0%)	97%
1 (20%)	2.40	0 (0%)	0 (0%)	0 (0%)	0 (0%)	5 (100%)	0 (0%)	0 (0%)	87%
1 (25%)	2.00	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (50%)	2 (50%)	0 (0%)	82%
0 (0%)	2.67	3 (50%)	1 (17%)	1 (17%)	0 (0%)	6 (100%)	0 (0%)	1 (17%)	83%

Figure 3 - The Fuse Ribbon Analyzer computes overall quality scores in any number of categories from a series of subcontractor schedules. The project team may decide that all schedules must score "Green" before they can be integrated into the IMS.

Post-Pilot Rollout

With a successful pilot, your organization may elect to roll out the quality standards gradually to additional projects, begin all new projects with the quality standards in place, or apply them to all active and new projects.

The most effective suppliers can differentiate themselves by applying the quality standards across the enterprise portfolio. This assures customers that they will experience a consistently high standard of quality whenever they do business with these suppliers.

The commitment to quality and higher maturity must be relentless. With ever-increasing competition, these are critical differentiators. Today's metrics and quality standards may not meet tomorrow's needs. Commitment, persistence, and frequent sharing of successes and failures will cultivate the quality-oriented culture that leads to higher levels of maturity and an improved competitive position.

ACUMEN
Proven Project Analytics