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Understanding What Makes a Truly Good Schedule

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Abstract

Opinions about whether a project schedule fits its purpose are as many and varied as planners themselves. Even the need for one is frequently seen as merely obligatory. Project leaders assume they and their team already know how to deliver a project. Worse yet, when not formally required, any handy piece of scrap paper might serve as one. No wonder project planning is treated as an unprofessional discipline, a pseudo-science like reading palms, leaving no desire to ensure that the schedule serves its higher calling.

Such carelessness may be heavily punished in the inevitable commercial disputes that follow time and cost overruns. Assuming that, as the Benjamin Franklin axiom states, *an ounce of prevention is worth a pound of cure,* a schedule should be continuously checked against three holistic criteria:

- Content
- Technique
- Clarity

These three factors and their positive effect upon project outcomes will be presented in detail. They are the means to creating a valuable project delivery tool. A holistic approach based on them is a promising start to building and maintaining an excellent schedule that drives positive change in project delivery.

Contents

Introduction

"If you fail to plan, you are planning to fail."

—Benjamin Franklin

Too many projects fail, and there are constant reminders that a large percentage are completed late, over budget, or both. There are diverse criteria for identifying those failures, diverse measures for assessing their extent, and at least as much guidance on how to identify their causes, assign blame, and profit from them. Somehow, an almost obsessive focus on how to measure failure appears to have failed to deliver an actual improvement in success rates. The authors wanted to know what role good or poor project planning played in this and whether they could do anything about it.

What started out as something of an intellectual challenge soon led the authors to recognize that there may be something fundamentally wrong with the way many projects are initiated and that, yes, poor planning plays a part. At this stage, they faced a choice:

- Should they consider the role of planning methods throughout the whole lifecycle of projects, or
- Should they limit the scope, at least at this point, to the stage when the schedule is first created?

The latter was chosen on the basis that, without a good start, based on sound foundations, the prospects of a successful outcome for any project are limited, regardless of subsequent course adjustments.

Having made this choice, the authors found themselves in an interesting position: able to ignore much of the body of knowledge that guides and dominates planners' lives and, especially, the industry built on measuring failure after the event. They have also chosen to ignore the methods and guidance associated with identifying whether a schedule is progressing well or badly during its life; they have done this on the simple premise that the answer is normally self-evident because a project manager knows when things are going badly, even if they do not know precisely how badly or indeed what to do about it. The two almost naive questions the authors set out to answer were therefore no more and no less than:

- How does one create a good project schedule?
- How does one assess a good project schedule?

Two questions, but just one answer!

The path to that answer, however sophisticated, begins with a vacuum. Given all the knowledge and material available to planners, there is no primer that lays out the fundamentals in plain terms. The authors really had to go right back to basics, and the subsequent journey turned out to be quite an education, even for three aspiring experts in the field.

Opinions about whether a project schedule fits its purpose are as many and varied as planners themselves. Even the need for one is frequently seen as merely obligatory. Project leaders assume they and their team already know how to deliver a project. Worse yet, when not formally required, any handy piece of scrap paper might serve as one. No wonder project planning is treated as an unprofessional discipline, a pseudo-science like reading palms, leaving no desire to ensure that the schedule serves its higher calling.

Such carelessness may be heavily punished in the inevitable commercial disputes that follow time and cost overruns. As the well-known axiom states, an ounce of prevention is worth a pound of cure; a schedule should be continuously checked against some holistic criteria.

There are published standards, guides, and recommended practices for schedule development, e.g., by PMI (Project Management Institute), AACEI, GAO (the US Government Accountability Office), and APM (the UK Association for Project Management). These standards address detailed best practices. The authors' intention is to complement the existing methods and standards and challenge them when necessary. This paper sets out to clarify the absolutely fundamental building blocks of what it takes to produce a good schedule from the outset, thereby providing a context for existing standards and practices. This paper, then, becomes the missing primer.

Regardless of authorship and methodology, good governance will always require review, acceptance, or rejection of the schedule. However, the reviews often lack a holistic and structured approach. Even if criteria for rejection exist, they tend to categorize rather than to guide.

For example, NEC3 (the UK NEC Engineering and Construction Contract) Clause 31:

- Contractors' plans shown are not practicable.
- It does not show the information that this contract requires.
- It does not represent the Contractors' plans realistically.
- It does not comply with the work's information.

In other words, "I don't believe you, or you've missed something."

Having established the need for fundamental building blocks, the authors propose that a viable schedule should be built and assessed against a framework derived from three holistic criteria:

- Content
- Technique
- Clarity

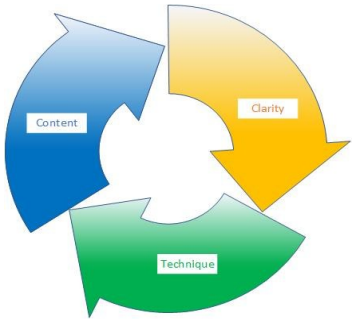

Figure 1-Schedule Criteria

This paper explores these criteria and offers some insights. While aware that the devil is in the details, the authors hope to establish three simple but robust foundations to build upon.

The identified criteria are closely interdependent, and it is therefore imperative that a good schedule utilize all three. For instance, a good schedule cannot exist with great content but dismal technique, or even with both great content and technique but terrible clarity. The *goodness* of the schedule, beyond its quantitative quality score, stems from adopting each criterion and having them work together. Developing good content will require skills and knowledge that are part of the technique.

While there are many accepted planning and scheduling methods (e.g., PERT, Lean, and Critical Chain), this paper focuses on the Critical Path Method (CPM). Also, this paper does not explicitly address resources and cost loading; however, all the elements discussed here would apply to cost and resource-loaded schedules as well.

Content

"There are times when the unseen can be even more dangerous than what our eyes behold."
—**Erin Forbes**

Content in this context refers to the elements derived and input into the schedule, not to elements calculated, even if the latter constitute essential components of the schedule. For example, the authors consider durations and logic to be key content elements, whereas tasks' start and finish dates are considered calculated elements.

Ensuring good content also means gathering information from all possible sources and collating it in a cohesive, clear manner.

Thus, to ensure great content, special attention needs to be given to the following:

Entirety of Scope

The entire scope applies to the review of the work's information, functional requirements, technical specification, construction drawings, contract, bid assumptions, and lessons learned from previous projects. Extracting the project scope in a coherent, clear manner requires skill and experience, as discussed in the paper's technique section. It may be done independently as the first step or collaboratively as part of a workshop.

If the schedule either does not include everything in scope or includes work not part of the contract, it is not meaningful. This statement is known as the *100% Rule*. Developing the Work Breakdown Structure (WBS) is an accepted method of scope identification. The WBS and, by extension, the schedule must therefore include 100% of the work defined by the project scope and capture all deliverables.

Consideration of Project-Specific Limitations

Limitations in this context refer to elements that impact the way an activity may be performed, the timing with which an activity may be performed, or the conditions in which an activity may be performed.

While this may seem obvious, it is an element that is often missed or excluded in many schedules, leading to increased risk and poor quality. These limitations may be:

- Time-related - for example, equipment ship times, which define when such equipment can be installed. Concrete cure times, which define when succeeding work may proceed on the concrete.
- Environmental Conditions – Work in extremely hot or cold weather may restrict the times of the day that work is allowed and even the seasons during which work may be carried out. Planning for such constraints in the schedule is critical
- Labor – Labor constraints may refer to the availability of skilled labor or the required use of union vs. non-union labor.
- Location-related Limitation – These may refer to geographic location, which may define means and methods, but also site location. For example, urban construction sites may be constrained by space and storage, which may affect the sequence of construction and the means used.

It is important not only to incorporate the limitations into the schedule but also to communicate them effectively. This should be done by including it in the Schedule Narrative and the schedule itself.

Collaboration with the Project Team

Ultimately, it is the project team that will execute the project. If the schedule does not reflect their vision of what the project schedule needs to include, it is not a useful tool. The schedule needs to reflect the project team's view of how the project will be executed. Planners need to pick their colleagues' brains.

Durations

Establish realistic durations. Ensuring that capacity, historical data, client expectations, and constraints are considered is key to developing high-quality content. Also, take into account the project team input and expert opinion from trade partners.

Logic

Logic dependencies between tasks (and milestones) are an absolutely fundamental element of the schedule content. It is as important to establish the work sequence as it is to identify what the work is. This principle is at the core of the CPM (Critical Path Method).

Include Implicit work

Good content requires that processes such as submittal and approval, risk, procurement, and quality control, and any other work that could have an impact on the project duration must not be taken for granted. While each of these processes may be independently tracked, their impact on the schedule is unavoidable. For example, the need to ensure procurement aligns with when materials and equipment are needed on site. It is essential to make realistic provision for the possibility that some submissions may be rejected and require resubmission. The consequences of this cannot be overstated.

Contingency

All schedules should include a contingency for unexpected events. Some contracts require that contingency be built into the schedule as an explicit task. Contingency may be considered for events such as inclement weather, unforeseen conditions, and geographical or political uncertainty, among others.

This should not be a *technique*-related matter, but one of the main initial considerations of building the schedule model.

"Plan the work, then work the plan" is not a mandate for planners to take charge; it is a mantra for the whole team. Failure to consult colleagues rarely ends well for the planner. The most meaningful and realistic schedules are produced by planners—the facilitators who ensure it is "our plan, not my plan." Of course, this requires time and patience, which may be

limited in the early stages of a project when the initial schedule needs to be agreed against uncompromising deadlines, but beware of those tempting shortcuts that may turn out to be cul-de-sacs.

Garbage in, garbage out!

Technique

"*It isn't what you do, but how you do it*."

—John Wooden

Technique refers to a particular way of doing something, especially one that requires specialized skills; good planners must be competent with their planning tools, but such skills can be acquired. However, that is just one element of a good scheduler. The ability to construct schedules to a high standard is scarce because it depends on aptitude, training, and experience. This ability is important enough that AACEI has dedicated an entire recommended practice (Recommended Practice No. 14R-90) to the discussion of required skills by a planning and scheduling professional. The character of planners also matters, particularly their communication skills and their integrity.

Technique is the one aspect of schedule development that is very heavily skewed to the skills and experience of the individual responsible for building the schedule. However, there are ways to limit scheduling inconsistencies by ensuring the scheduler follows the guidelines, standards, and recommended practices published by leading professional associations and institutions in project management, e.g., AACEI, PMI, APM, GAO.

Following these guidelines should be a bare minimum first step in the scheduler's repertoire.

This chapter describes the *particular* way of producing the following elements that must be contained in a high-quality schedule.

How to include the entire scope

Ensuring that the entire project scope is captured in the schedule is probably the only rule with universal consensus. However, the way in which this should be achieved, in a quantitative manner, is subject to debate.

To the best of the authors' knowledge, no internationally recognized scientific method exists that demonstrates that the entire scope, and nothing outside it, has been captured.

The following approaches will certainly facilitate the achievement of the intended objective:

- The WBS 100% rule is an important guideline, but it is difficult to provide quantitative evidence that the scope, measured at any level of the WBS, represents 100% of the

scope. It is a statement of the obvious, though it needs to be supplemented by techniques that can elicit the unknown.

- Close examination of all applicable project documentation will reveal explicit scope requirements and clues to less obvious ones.
- Engagement and input from key stakeholders are key components. This needs to be done with both the client and contractor subject matter experts. This engagement or debriefing can be done in a series of interviews or as part of a workshop. The goal is to understand the stakeholder's intent beyond what is explicitly stated in the project documents.
- Engagement and input from the project team that is the ultimate responsible party of the project execution are also fundamental.
- Engagement needs to take place early and often!
- The project planners' role as facilitators depends on their maturity and experience. Generalist planners need to pick their colleagues' brains. Highly experienced specialist planners may know their sector so well that they can effortlessly clone suitable work packages, but the best of them will always engage with their colleagues too.
- The method employed to create a sound WBS (Work Breakdown Structure) is extremely important, and substantial good practice standards exist. However, poor technique abounds.
- A good part of creating good content is acceptance at appropriate organization levels (e.g., senior leadership).

How to define constraints

The Triple Constraint Theory [1], in use since the 1980s, states that every project operates within the scope, time, and cost boundaries.

However, there is no standardized and internationally recognized verification method.

- The Scope constraint has been addressed in the previous paragraph.
- The Cost constraint, although extremely important, has been excluded from this paper.
- The Time element is addressed in this paragraph.

In practice, keeping time constraints in account can be achieved as follows:

<u>Project-level constraints</u>

In some projects, either the start date, the finish date, or both are determined by non-negotiable requirements, e.g., social or political. For example, both start and finish dates of the Olympic Games in city XYZ cannot be missed (unless there is an extreme global crisis).

In these circumstances, the Project team must plan and produce a schedule that fits within the start and finish dates, accounts for all risks, and includes some contingency.

This overarching constraint is usually addressed by imposing a hard deadline for the project's completion. Any delay will result in a highly visible negative float.

Phase level constraints

In many projects, the work is broken down into phases, which may require completion within a given date; a savvy planner will ensure that the schedule clearly identifies the grouping of tasks included in the *phase,* that the scope is logically tied together, and that it drives a milestone that identifies the required phase constraint.

Task-level constraints

The application of constraints at the task level is where the majority of poor planning techniques are used.

All constraints result from a deliberate intention to interfere with CPM calculations and, thus, good schedule logic. Given the effect of a constraint, they should be used only in those cases where there is no other way of achieving the desired effect. They should be continuously reviewed and justified. The authors advocate near-zero tolerance. The criticality arising from acceptable constraints may distract the team's attention from the real criticalities, i.e., those arising from the appropriate definition of the tasks' duration and logic dependencies.

How to define tasks

In this context, *tasks* include both proper tasks with a duration greater than zero days and milestones (start and finish, with a zero–day duration). The ultimate objective of the task's definition is to provide all the project team members with a common understanding of the lowest level of detail of the work represented by the WBS node that the tasks belong to.

The way tasks are defined is another aspect of the project schedules, the importance of which is often grossly underestimated. A general rule for defining tasks cannot be established, as it depends on the overall planning strategy the project team has adopted. For example, a *rolling-wave* approach will, by definition, result in a more granular definition of the tasks planned for an agreed time window, e.g., six months, whereas the definition of future activities will be less detailed.

Some good practices may include using metadata in the planning tool to include elements that would otherwise make the task name too long. Include activities that may be considered either *implicit* or included in other activities or in the dependencies.

Important note

Although this paper does not intentionally cover resource assignments (human, material, and plant) or cost assignments, a fundamental characteristic of the task is that the work associated with it must be measurable according to an agreed method.

Should the above rule not be applied, advancing the schedule will generate ongoing disputes and negatively affect the production of progress reports and dashboards.

Task duration

A realistic assessment of the activity's duration is a critical aspect of a high-quality schedule. It is also one of the areas where a wide range of approaches is adopted, from very aggressive to very prudent.

Good practice rules exist that determine how duration is assessed, based on productivity, experience, and other factors. However, many factors must be considered when assessing task duration, many of which are not directly controllable by the project team. These may include shipping methods, environmental conditions, labor availability, or weather.

How to define the correct logic

The application of the correct logic plays a fundamental role in establishing schedule quality. However, as in this case, the techniques for applying logic are not always consistent within the planning community.

Existing standards/recommendations and tools have contributed to identifying poor compliance with the adopted standards/recommendations. However, a high score is a *necessary but NOT sufficient* condition for achieving a high-quality schedule. Logic compliant with standards is not a guarantee of good logic!

Broadly speaking, two types of logic factor into the application of the technique:

Hard logic

This type of logic, which is non-negotiable and should always be applied without any exception, covers a wide range of possibilities, from compliance with simple laws of physics (e.g., pouring a slab must be preceded by the construction of its supporting columns) to creating the sequence of Testing & Commissioning activities of a complex system.

The above logic should be applied with contributions from the required type of experts; in some instances, the degree of specialized knowledge may be very high.

Soft or preferential logic

Whereas hard logic results from technical knowledge, soft logic reflects the decision to establish sequences that are entirely dependent on the project team's initial thoughts, which may change drastically during the project execution stage. For example, a North-to-South construction strategy may be replaced by a South-to-North one.

Whatever type of logic is applied, redundant logic must be avoided, as communicating it to the entire project team is not easy, making sharing the logic and obtaining team buy-in even more difficult.

Manual identification of redundant logic is not a simple task; luckily, some scheduling quality assessment tools not only detect but also remove redundant logic dependencies.

How to assess risk and contingency

Optimism bias is the enemy of realistic planning, and good planners must consider different time-related risks when creating a schedule.

Introducing contingency in the project schedule is an initial strategic decision that must come from the top, and that the whole project team, including the client, should be aware of.

Assuming that it has been decided that some form of contingency should be built into the schedule, i.e., that an amount of time is included in or added to a schedule, more than one approach may be adopted, as outlined below:

- the additional time could be in the form of one or more pseudo-activities inserted at some point of the schedule, sometimes at the very end
- the additional time could be in the form of an increase of the duration applied to activities that contain elements of risk or uncertainty

How to make the best use of the planning software capabilities

"A bad workman blames his tools."

—Anon

Planning tools have greatly facilitated the production of schedules, and there are several options. Different tools come with different capabilities, different fans, and inevitably different prejudices amongst planners (e.g., too complicated, too simple, or too expensive).

For non-planners, distinctions are even more difficult as planning and planning tools are often viewed as highly specialized, even a black art.

A wide variety of Planning software is available on the market, from very simple to extremely complex. However, it is obvious that the selection of a particular professional planning tool is secondary to the decision to use one in preference to Excel or the proverbial paper napkin in the first place, because a competent planner will compensate for any software weaknesses.

The best use of the planning software capabilities depends on the appetite for accurate and reliable time (and cost) control, combined with the project team's cultural level.

Organizations (contractors or investors) engaged in projects where the time element is critical (e.g., the Olympic Games or other prestigious events) may be required to adopt software deemed to offer the most powerful time management capabilities.

On the other hand, organizations typically involved in relatively small and sometimes partially repetitive projects may choose their software based on personal preferences.

One aspect of the software tool that is increasingly recognized as important is its ability to become part of an integrated digital environment where data *flows* seamlessly from one so-called *vertical* application to the others. The most obvious example of this form of integration is 4D (3D modeling + time) and beyond.

How to ensure the size and complexity of the schedule are appropriate for the project.

"Expansion means complexity and complexity decay."

—C Northcote Parkinson

The size and complexity of the schedule are big subjects that one can barely touch on at this point. To establish an appropriate scale and structure for the project schedule, many factors need to be taken into account, some that work together and others that work against each other.

These include (but are not limited to):

- Scale of the project
- Cost of the project
- Duration of the project
- Complexity of the work
- Level of detail specified by the stakeholders
- Integration requirements (e.g., part of a larger program)
- Level of understanding of the work

- Acceptance of progressive elaboration/rolling wave techniques
- Capacity of planners
- Requirements to integrate the schedule with other software (e.g., EVM-specific tools)

There is no simple answer or universal formula that can be applied. The size and complexity of the schedule are characteristics that need to be discussed and agreed upon prior to developing the baseline schedule.

The big question

Is the schedule constructed according to sound principles by someone who knows what they are doing?

Within a schedule itself, there are recognizable technical deficiencies that can seriously undermine it; for example, open-ended activities and excessive constraints are pitfalls known to most planners, and they are easily detected. Other, more nuanced dangers, such as a lack of detail or inappropriate use of lags, will make a schedule ineffective, harder to understand, harder to maintain, and ultimately less credible to third parties.

Schedule quality requires attention to detail that must not be neglected. Software has emerged in recent years that is so fast and effective at providing a quantitative measure of schedule quality that it removes the tedium of doing it manually; there is no longer any excuse for a badly constructed schedule. Critically, such software is increasingly being used by others to judge one's work, so get ahead of the game.

Irrespective of the methods and tools used, the quality of the schedule heavily relies on the planner's character, skills, and experience. Unfortunately, the construction industry is among the worst at nurturing and recognizing the strategic importance of a good planner.

- Lack of respect for the planning and scheduling
- Corresponding lack of respect for the planning profession
- Inadequate selection criteria for planners
- Lack of compliance with professional standards

Clarity

"The single biggest problem in communication is the illusion that it has taken place."

– George Bernard Shaw

Even the best constructed and comprehensive schedules may still fail to communicate. Thus, authors and readers alike come to the third essential criterion – Clarity.

It is tempting to assume that because competent planners know what they are doing and has delivered a good schedule that their responsibility has been fulfilled, but this is where the old adage "*the job's not over until the paperwork is done!"* serves as a reminder that the schedule, no matter how superbly crafted, is not just another contractual checklist item; it is a communication tool. The function of the schedule is to deliver news, both good and bad, in a timely manner throughout the life of a project.

The schedule lies at the core of project management. It captures rules and inputs, processes them, and then delivers outputs. It is vital that, when communicating, it does so in ways that are clearly understood by project stakeholders. That means language that is clear, unambiguous, and thus effective.

Communication is complex and nuanced, so the paper will focus on the vital elements to ensuring that the project plan is fit for purpose:

- Is the schedule itself clear and easy to understand?
- Is there adequate supporting documentation?
- Is the schedule suitable for effective communication with its intended audience(s)?

The intention is to demystify the schedule.

Is the schedule itself clear and easy to understand?

"One should use common words to say uncommon things."

—Arthur Schopenhauer

Planners may believe that because they built the schedule, they will always understand it, but it is a dangerous presumption that their memory will always serve them faithfully. Furthermore, an indispensable planner is a sign of project risk management overlooking a single point of failure. So, a schedule needs to be clear enough that any other reasonably competent planner can understand it; better still, it should also be readily comprehensible to any other stakeholders.

The schedule should strive to be self-explanatory, for example, by adopting consistent and meaningful naming conventions, structures, and annotations.

Naming conventions can be contentious even within the same team; for example, some people prefer long descriptive names while others demand brevity. Even with many correct but diverse answers, there are still some indisputable elements of good practice; for example, deliverable Work Packages should be described by nouns and Activities by verbs. However, a thousand activities, each called "doing something," make no sense unless they can be differentiated from one another in a way that is both obvious and consistent.

A good or bad schedule will also have a profound impact on its ability to communicate effectively.

Most planning software provides User Defined Fields (Custom Fields), which can be used to record annotations, e.g., commentary on changes or a justification for constraints. It is essential that these be used liberally; they explain changes as they occur, serve as reminders throughout the life of the project, and help construct a comprehensive audit trail. Some software offers even more comprehensive note-taking capabilities.

Is there adequate supporting documentation?

"The most powerful words in English are, 'Tell me a story.'"

—Pat Conroy

However clear the schedule is, it is a specialist tool and thus unlikely to fully communicate to wider stakeholders on its own. That requires additional documentation, often referred to as a Schedule Narrative.

A Schedule Narrative is often a mandatory contractual requirement in its own right and is intended to provide confidence that the schedule is fit for its purpose. It identifies and explains the planning methods, inputs (facts and assumptions), with reference to WBS structure, naming conventions, resourcing, sequencing, use of constraints, critical path, risks, exclusions, exceptions, external interfaces, calendars, etc. It describes the routine processes to be applied during the project lifecycle, such as the update cycle (drumbeat/cadence), reporting requirements, earned value approach, rolling wave/progressive elaboration, change control, audit trail, etc. In short, it's the operator manual that explains and maintains the schedule.

The Schedule Narrative may have been prescribed by the client or developed independently by the contractor, but it is often neither. This invaluable document is frequently neglected, but the authors assert that it is essential. It should be recognized and agreed upon as a deliverable to stakeholders, which brings us to a fundamental deficiency in how many contract schedules are submitted and approved.

Typically, when a Schedule Narrative is required, it is created in parallel with, or even after, the schedule itself is built, rarely in advance. It seems so obvious that one cannot create an acceptable baseline schedule before agreeing on a method, any more than one can create detailed drawings before signing off on the outline design. This should not have come as a surprise, yet it is a great example of how a return to basics can cast light on bad assumptions. In the authors' minds, it is now an issue that cannot be *disregarded*.

It truly defies logic to work out, document, and (formally) agree on how to do something after having done it, yet in most situations, the contract is either silent on the Schedule Narrative or expects it to be submitted for approval at the same time as the baseline schedule.

This is sadly just one example of the many ways in which the contribution of a good schedule to a successful project, or the value of a competent planner, is often ignored by colleagues. The authors operate in a frustrating climate, but they seriously need to get out and challenge these things more. In what parallel universe does it make sense to spend years negotiating a contract yet give the scheduler as little as two weeks from the release of the works information (such as drawings and specifications) to submit a suitable baseline schedule, especially with no agreement on content or structure? If one thinks of it, where is the sense of allowing two weeks for the real work of building the schedule, yet four weeks to critique it? Issues like these are not trivial; a bad start to a project inevitably prejudices a good finish.

So, in an ideal future world, where does the Schedule Narrative fit in the early stages of the contract? Here is one vision, in which one can see that the authors have split the narrative ("how we are going to do it" and "what we have done"). For this example, the authors assumed no changes in contractual conditions, just an unusual degree of collaboration:

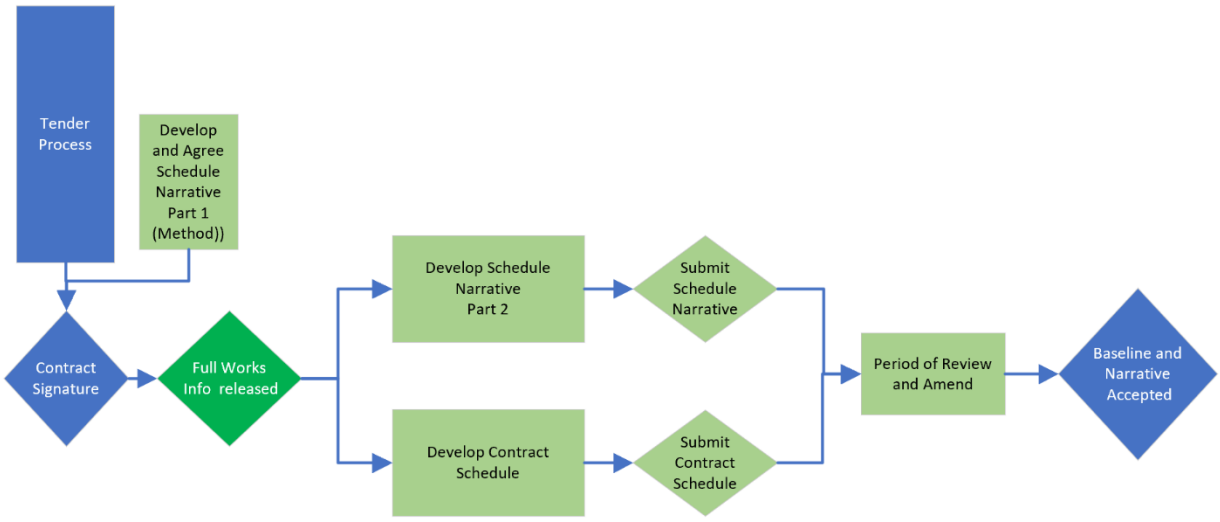

Figure 2 – The Schedule and Early Contract Stages

Lastly, the following is a proposed rule for Schedule Narratives. "**Even if it isn't formally required, provide one anyway!"**

Is the schedule suitable for effective communication with its intended audience(s)?

"Never treat your audience as customers, always as partners."

—James Stewart

Continuing with the theme of clarity: structure, naming conventions, coding, audit logs, and otherwise discretionary elements within the schedule should be reconciled with known reporting requirements.

The concept of clarity, the communication of the schedule in a clear manner, and the intended audience need to be in the planner's mind during the early planning and development phases of the schedule. The key is for the planner to respond to a schedule output request in a manner that meets the needs of the person requesting the information, without the planner having to go back to the drawing board to service the request. For example, a request for a schedule from a project executive should allow an extract that highlights the key milestones and the main summary task. Similarly, a request from a trade partner for a look-ahead schedule should allow the planner to extract the scope relevant to the trade partner for their easy consumption of information.

The Schedule Narrative should be comprehensible to people who are not planners, meaning it should avoid jargon and include a glossary. Think about including diagrams or tables; not only will these often convey information more effectively, but they also break up the monotony of pure text.

When considering an audience, take account of suppressed demand: end-users are rarely satisfied with early outputs. If they like what they get, they will doubtless request more or deeper reports or additional meetings. Anticipate and welcome this; stakeholder engagement is a good thing. It means the schedule is useful.

Put communication efforts to the test and ensure (internal) reviewers include a novice or advisors who are not shy of asking stupid questions.

Conclusions

This paper has barely touched on what makes a good schedule, but perhaps has shown that a holistic approach based on three criteria is a promising start. However, the discussion in this paper has addressed only the initial development of a baseline or preliminary schedule. There are additional standards and complexities when updating and managing schedules to ensure the schedule quality does not deteriorate as the project progresses. The inclusion of costs and

resources, along with the integration of change management and other control processes, would introduce greater complexity.

The authors have made the case that a prerequisite to the systemic problem of poor schedules lies in the proper application of published standards. However, this needs to be implemented using the holistic approach proposed based on good content, good technique, and clarity.

Figure 3 – Schedule Criteria Checked

The issue of sub-standard schedules and the inconsistent application of accepted practices and standards to schedule development is a self-perpetuated problem. Over the last two decades, as access to and availability of planning and scheduling tools have improved significantly, the quality of the schedules has not!

The lack of importance placed on developing and using a well-built schedule has forced career schedulers to seek alternative career paths. The lack of qualified resources and collective skill has resulted in schedules being developed in a subpar manner by inexperienced schedulers or by other team members who did not consider the task significant or important. This has led to the project team's lack of trust in using schedules, thereby creating a perpetual loop in which the industry is destined to work with poor-quality schedules.

It is not going to be easy to change peers' habits, but for the sake of all stakeholders, the time to start the fightback is now. Thus, in order to reduce the current systemic failures in planning and scheduling, the following may be additional thoughts for consideration, along with the criteria discussed in the paper:

a) Give adequate importance to the planning function
b) Ensure that high-quality professional planners are key members of the project team

c) Provide adequate support to the planner(s) in such a way that the project-program schedule is seen as the project team's schedule, not a contractual obligation or the product of an isolated member of the team
d) Ensure that all the contractual planning requirements are clearly understood by the project team, including the associated implications
e) Comply with all the contractual planning requirements
f) Exploit software tools that facilitate the quantitative assessment of the schedule quality
g) In general, before establishing the project Baseline, keep the following constantly in mind:
    a. the baseline schedule will inevitably require progressing
    b. very often, the project scope will require changes that must be reflected in the schedule

A good planner, properly supported by the project team, will ensure that the above-mentioned suggestions are successfully implemented.

Anything suggested so far can be implemented immediately. However, technological advances are starting to change and improve planning and scheduling. Some of these are briefly listed for consideration:

- Artificial Intelligence (AI) - Recently developed tools that exploit AI (Artificial Intelligence) constitute exciting and good news. However, since AI continuously learns from HI (Human Intelligence) and historical data, its success will depend on elevating our current efforts.
- 4D/5D Planning – One of the main advantages of 4D is to allow planners to bridge the gap between the design/engineering world and the construction world. It improves non-planners' understanding and communication of the planning sequence. 5D is improving the communication between cost engineering, design engineering, and planners.

It is prudent for current practitioners to explore these innovations and incorporate them to benefit the profession, rather than treating technology as a replacement for the profession.

There is a direct correlation between project failure and poor planning [2]. The purpose of good planning and good schedules is to improve project delivery and reduce systemic project failure.

References

[1] PMI, A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 2004.

[2] S. S. T. Brick, "Proper prior planning prevents pitifully poor performance," 2005. [Online]. Available: http://www.af.mil/news/story.asp?storyID=123012084.