Plan-to-Schedule Process White Paper

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Introduction

The plan-to-schedule aspects of VisiSuite's planning and scheduling method complement and augment the Visually Structured Planning aspects to provide a truly exceptional solution. In a very real sense, they are inseparable elements. It's the combination of both that produces the full potential benefits of professional planning and scheduling. I strongly recommend that any serious PMP read both the Visually Structured Planning White Paper then this paper.

I'll first present my opinions regarding the shortcomings of traditional scheduling methods. In this case, traditional shortcomings can only be discussed in the context of the intentions and necessities that motivated the scheduling effort. I'll describe several common motivators and how they define and limit the resulting value added to the effort. Historical precedents as well as my experience with them will be described to give proper credit for their incorporation into our distinctive solution. Then, I'll present a fairly detailed justification for how applying our solution can produce extensive quantifiable benefits during program planning and execution.

Plan-to-Schedule Process Overview

Simply put the Plan-to-Schedule Process calls for the development of an Integrated Master Plan (IMP) as the foundation for an Integrated Master Schedule. However, in the context of Visually Structured Planning far more than a formal Integrated Master Plan is developed. The formal output from an IMP, as defined by the Department of Defense, is a strictly sequenced table of Events, Accomplishment and Accomplishment Criteria. Events, Accomplishments and Accomplishment Criteria are formally defined as:

> "The events in the IMP are transition points between the major activities. They may include demonstration milestones, major verification efforts, technical or program reviews/ audits, and other key decision points where it is necessary to measure and demonstrate progress before proceeding with follow-on efforts."
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> "Accomplishments are interim or critical activities that must be completed prior to an event. Accomplishments are normally grouped by Integrated Product Team (IPT) within each event, to ensure the IMP correctly addresses the interrelationships among all program functions."
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> "Accomplishment criteria are measurable and useful indicators that demonstrate the achievement of maturity/progress in an activity or accomplishment has been achieved."

Our planning process produces all of the above as well as:

- All levels of work team structuring
- All inter-team dependencies
- Identification of specific risk mitigation accomplishments and risk mitigation criteria
- Graphical documentation of proactively agreed to inter-team/intra-team cooperation

- Planning charts that become invaluable internal/external communication tools during planning and execution

Therefore, we generate a macro level Integrated Master Schedule (IMS) from a more robust foundation than a formal IMP. As proud as we are of this fact, it does not directly account for the benefits described in this paper. The salient point here, is that it's the quality of the product/process development plan not its mere existence that produces quantifiable performance benefits.

Traditional Scheduling Shortcomings

Intention versus Added Value

I'm a bit apprehensive about this section of the paper. I don't wish to come across as arrogant but I've been at this a long time and witnessed a lot of planning and scheduling efforts. My exposure is usually after my client recognizes the shortcomings I am about to describe. So I submit the following as my personal observations and the opinions that I've adopted as a result.

Establishing a Negotiated Timeframe that's Compliant

Most of the planning and scheduling outputs that came into my awareness over the last 30 years seem to fulfill the minimum requirements defined for their intended use. Many of these were developed and submitted in a proposal or bidding situation. It seems very apparent to me that they were prepared to provide a proposed timeline in response to some form of Request For Proposal (RFP). Considerable effort is usually invested to make them compliant. That is to say, ensure that all requirements identified in the RFP are included in the schedule timeline and all the specified dates are met.

I can't help but believe the creators never intended for the schedule to actually be used should their company win the job. If the company does win and has the wisdom to manage the program with a plan/schedule my observation is that an entirely new and very different (usually a much less detailed) schedule is developed and employed. I've seldom seen any program schedule religiously maintained and kept up-to-date. When a major change in scope occurs it seems to be a common tendency to abandon plans/schedules entirely.

Documenting Timeframe and Keeping Score

This situation is different from the one above. Serious effort is invested in creating a credible and comprehensive detailed schedule that is then religiously and accurately maintained. The trouble is that the focus is completely on "score keeping". By that I mean the obvious intention is to accurately record actual occurrences and measure historic project performance. These are worthwhile goals but there appears to be no interest in projecting future occurrences.

This fact is clearly reflected in the lack of mechanical and logical network schedule integrity. Truth be stated candidly, there are frequently very few, if any, dependencies incorporated into these

schedules. Instead the schedule dates are “hard wired” using a preponderance of target date constraints. Therefore, when a task starts and/or finishes late there is no “ripple effect” on later tasks. I’m sorry to say that about 80 percent of the program schedules that I’ve observed over three decades fall into this category.

Providing a Predictive Model of Program Status and Performance

When I occasionally encounter an earnest attempt at producing a truly predictive schedule, it always excites me and restores my faith in professional planners and schedulers. Don’t get me wrong there are quite a few well developed scheduling models that are accurate and comprehensive. I’m always impressed with the project management professionals that produce them. Without the benefit of an effective process or user- friendly software, producing a high fidelity schedule can be a daunting task.

Yet these rare examples, fail to meet half of the ambitions that we unfailingly achieve with our VisiSuite solution. The main reason for this regrettable reality is that they were not constructed on a strong plan and therefore do not produce the plan-to-schedule benefits I will explain in this paper.

Document Risk Mitigation, Quality and Development Processes

Program schedules that directly incorporate a well conceived product development process designed to ensure quality are rare and refreshing. Many also clearly identify well thought out risk mitigation strategies. Unfortunately these all too often lack network schedule integrity or are never actually used to direct the efforts of the resources working on the program. I could count on one hand, examples that met these criteria yet did not reflect one or more of the shortcomings described above. In addition, some rigid development process life cycle models actually work against the goals of a program. But this paper is not about the relative merits of different process models, so I’ll move on.

Truly Manage Work Efforts and Improve Performance

There are a good many program plans/schedules that avoided all of the above stated shortcomings and actually had the potential to manage the day-in day-out resource work efforts in a way that would measurably reduce risks and improve program performance. This I can verify because I have participated in the development of some of them. I’ve also observed many that I had nothing to do with creating. Yet very few of these exceptional plan/schedules actually returned the full potential benefits to the companies for which they were produced. But I’m way ahead of myself.

Initial Intention Limits the Benefits that will be Realized

The point of this entire section is simple. The above described planning and scheduling efforts almost never exceeded the intentions of the participants. People who appreciate the benefits of good product development processes do not always see the full potential that excellent planning and scheduling can add. In fairness, there is a good bit of understandable skepticism about the likely return-on-investment that professional planning and scheduling will actually deliver. I know

that professional planning and scheduling can produce performance improvements because I've witnessed it. I also have strong opinions about what it takes to achieve them.

Historical Precedents

As I look back on my career, I recognize how truly fortunate I've been to have had such a broad base of experience over so long a time. As President and CEO of Computer Aided Management, principle in several other excellent project management consulting firms and co-founder of VisiSuite LLC, I have worked with hundreds of companies and agencies of all kinds. Among them were excellent companies that were continuously advancing processes and techniques. I wish to share some of my experience working for those companies to illustrate both the positive and negative experiences that have biased the opinions expressed in this paper.

Product Development Process Gates and Process Models

My first experience with a phased development process model was in the 1970's when I supported a very large cellular infrastructure and cellular phone development company. We spent years helping them plan internationally distributed development projects using early versions of Visually Structured Planning and VisiSuite (called "Intercomm" at the time). Both divisions embraced the process and standardized on the use of our solution.

As often happens in large companies, there was a major re-organization, and things began to change noticeably. It was at that time that the corporation sent a dozen or so middle managers off for a year to develop a "stage gate" product development process for cellular infrastructure programs. I observed the effort and its output with great interest since it was entirely compatible with our philosophy of planning, scheduling and project management. The results were notable and the adoption of the process clearly seemed to reduce re-work, lower risks and produce quality systems. On the flip slide, the projects took longer to complete and often the commendable process methods were simply abandoned in order to make up time. I could not help but believe the net effect never approached its true potential.

On the other hand, I had a subsequent experience with Black & Decker which I felt achieved the full potential of phased development process modeling. I worked with both the Tools Division and the Accessory Division, for several years. Black & Decker developed an excellent gates process for both divisions and when it was completed they engaged my firm, to implement the processes world wide. Working with their operational managers we developed a project management training program that consisted of equal parts of gates process training and training on how to plan, schedule and manage projects using Visually Structured Planning.

It was during this timeframe that I came to appreciate the true potential that could be derived by marrying an excellent development process with an effective planning process. Having a generic planning framework to jump start a new product development planning and scheduling effort was very successful. It definitely saved time, ensured a reasonably conservative work sequence that avoided unwarranted risks and ensured a quality product. On the other hand, by assembling the right people for well focused planning sessions, each and every effort was thoroughly analyzed and its unique circumstances evaluated.

This approach avoided delays when time-to-market was paramount, and the new product was a spin-off of an existing product. Conversely, attention was given to especially high risk situations, and intelligently conservative deviations from standard practices were taken. In a very complementary way risk mitigations, alternate and parallel development efforts, critical reviews and decision points were incorporated into the plans/schedules. In addition, and even more significantly, the project managers were trained in effective project review techniques and frequently conducted major re-planning sessions. They responded quickly to changed circumstances or when it became evident the original plan was simply not working. They were able to avoid traditional shortcomings of "stage gate" processes, which can force fundamental project decisions to be made earlier than necessary, thereby restricting flexibility to respond to change and raising the cost of change.

Integrated Process and Product Development (IPPD)

Early in the new century, economic conditions found us more frequently employed by government contractors, defense contractors and aerospace firms. I was pleasantly surprised to learn that the Department of Defense (DoD) had developed their own product/process development method that they called Integrated Product and Process Development (IPPD). I was fascinated by their IPPD process, which I could not help but feel was conceptually brilliant. I was also very encouraged to see that they recognized the value of an Integrated Master Plan (IMP) and making it the foundation for an Integrated Master Schedule (IMS). Here are some quotes from their August 1998 Integrated Product and Process Development Handbook.

Overview

> "Integrated Product and Process Development (IPPD) evolved in industry as an outgrowth of efforts such as Concurrent Engineering to improve customer satisfaction and competitiveness in a global economy. In May 1995, consistent with the Department of Defense (DoD) efforts to implement best commercial practices, the Secretary of Defense directed a fundamental change in the way the Department acquires goods and services. The concepts of IPPD and Integrated Product Teams (IPTs) shall be applied throughout the acquisition process to the maximum extent practicable."
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> "An Integrated Product Team (IPT) is a multidisciplinary group of people who are collectively responsible for delivering a defined product or process. The IPT is composed of people who plan, execute, and implement life-cycle decisions for the system being acquired. It includes empowered representatives (stakeholders) from all of the functional areas involved with the product—all who have a stake in the success of the program, such as design, manufacturing, test and evaluation (T&E), and logistics personnel, and, especially, the customer."

IMP

> "One way of defining tasks and activities to reflect an IPPD approach is the use of an integrated master plan. Within an IPPD environment, the integrated master plan provides an overarching framework against which all the IPTs can work. It documents all the tasks required to deliver a high quality product and facilitate success throughout the product's life cycle."

> "The specific format for this plan is not critical; however, it usually reflects an Event/Accomplishment/Criteria hierarchical structure—a format that greatly facilitates the tracking and execution of the program."
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> "In an IPPD approach, functional and life-cycle inputs are required to integrate the product and associated processes produced by the program. Without formal documentation, such as an integrated master plan, these inputs may be lost when personnel change. Such a plan also defines and establishes the correct expectations."

IMS

> "Event-driven schedules and the participation of all stakeholders are the IPPD principles involved in developing a program schedule. All stakeholders have to work against the schedule, and all tasks need to be accomplished in a rational and logical order allowing for continuous communication with customers."
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> "When documented in a formal plan and used to manage the program, this event-driven approach can help ensure that all tasks are integrated properly and that the management process is based on significant events in the acquisition life cycle and not on arbitrary calendar events. Deriving the program schedule presents an opportunity to identify critical risk areas. As IPT members estimate the times to complete specific tasks, events that may cause delays will become apparent."
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> "One way to produce such a schedule is to develop an integrated master schedule based on an integrated master plan."
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> "The integrated schedule begins as an integrated master plan with dates—the starting points are the events, accomplishments, and criteria that make up the plan."
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> "In an IPPD approach, an integrated master schedule performs the same job it always has—to track schedule variations. But with an IPPD approach and when the integrated master schedule is tied directly to the integrated master plan, the schedule also tracks the activities that provide functional and life-cycle inputs to product development. In this role it provides a crosscheck not only that the inputs were obtained, but that they were obtained at the right time. "

Like many great concepts, the reality of how they are executed does not always track to the objectives and intentions. A critical aspect of IPPD is to have the IMP become the foundation for the IMS. DoD, requires a cross-reference to be produced so that it can verify that all the elements of the IMP are in fact comprehensively and accurately replicated in the IMS. In practice, this is very difficult to accomplish and even harder to audit especially with a large complex IMP/IMS. We solved the problem for our clients with technology. VisiSuite directly produces the IMS from the IMP and automatically cross-references it. Better than that, it constructs a modular "skeleton" for each work team (IPT) that they can simply "flesh out" with detailed tasks, which are sized, linked and (sometimes) resource loaded.

How the Structured Planning builds on these Precedents

Unfortunately the IPPD process does not suggest an effective way to construct a first-rate IMP/IMS. Traditional planning and scheduling packages are built to sell. Therefore, they provide a generic scheduling capability not a full solution that will produce consistently excellent results. I've seen lots of home grown approaches to doing IMP/IMS and I have to say that I could not produce a first class IMP/IMS using them. It's just a whole lot easier, quicker and more effective to use our process with VisiSuite. The main reason being that both the process and software application were field developed to specifically do that exact job.

The Plan-to-Schedule Process adds Substantial Value

So how does our Plan-to-Schedule Process add considerable value? I've listed the reasons, in sequence by what I consider most important and most challenging, and I've left out those things universally done because they are mandatory and less demanding. Please do not misunderstand me, some of the topics that I haven't covered in this paper are time consuming and labor intensive. But they are straight forward and generally done well.

The Smartest Plan for this Program

I won't waste words describing what the smartest program plan will do. Everyone has opinions about that, but it might surprise you, if I state that the smartest plan/schedule will substantially improve program performance, reduce time to market, and produce a product/process that exceeds expectations. Smart plans are developed by smart companies and agencies. Smart companies, learn quickly and retain what they've learned. Smart companies employ best practices so they have already adopted an excellent development process life cycle and they are applying it flexibly to their advantage. Smart companies employ smart, experienced, and highly talented people. So let's look at how the plan-to-schedule process fits into producing the smartest possible plan for a specific program/project.

The Risk Assessments as Sequencing Judgment Calls

I want to start by making an important observation that consistently applies to product/process development programs. You may not have given this much thought but I consider it critical in producing a smart program plan/schedule. The sequence in which work is done is seldom dictated by what's possible to do first, second and third. More often than not, the sequence in which the work is done is exclusively a judgment call. It's possible to perform tasks well before it's intelligent to perform tasks. What is being judged? Nine times out of ten it's risk. Smart companies know that, so they have great processes that guide the organization to work smart.

But, "one size does not fit all" circumstances, and it's this recognition that differentiates a great plan from a good plan. What is necessary is to assemble the very best minds, armed with great processes and tons of experience and ask them the right questions, so that the very best decisions can be made during initial planning or re-planning. Our process/product enhances a good planning facilitator and provides a self-documenting focus for these decisive communications.

Simply stated, the right people have to come together at the right time, have effective communications, about the really important issues, reach consensus, make decisions, and record decisions. Then those recorded decisions have to directly guide the day to day work efforts of the program's resources.

Deliberate Deviations from Product Development Processes

One of the hardest judgment calls is when to deviate from a proven product development process. Again, the most qualified people, with the biggest stake in the outcome, need to make those calls. Yet, if they make those difficult calls correctly, the company performs better than expected and beats its competition. Knowing when a risk is reasonable and planning to take only reasonable risks can deliver a product to market ahead of the estimated completion, without comprising quality. One thing I want to stress however is that the very best judgments made by the right people may not directly guide the way the work is actually executed by program resources. Plans and schedules do not perform the work on the program, people do. On the other hand, companies that are excellent planners are usually also very effective staff management companies and are experienced at getting the best from contract workers and teammates.

Product and Process Development Methodology

I sure don't consider myself an expert on product development methodologies. One thing I do know is that the smart company is always learning. Better than that, every lesson benefits future efforts. So I believe that excellent companies have several development processes that they selectively employ as specific program situations dictate. I also believe they are constantly revising and refining their processes and procedures. VisiSuite supports building a library of process templates that have proven themselves, on differing program types, over time. These templates should be constantly refined, improved and reused as the starting point for developing each new program plan/schedule.

Integrated Risk Mitigation Strategies and Implementation

Risk management presents very interesting challenges. A "divinely inspired" risk mitigation strategy is only as good as the information and experience the companies' great minds have at the time they develop it. We live in a very fast paced technological society so what's really smart today can prove to be very dumb tomorrow. Risks and risk strategies must be closely and constantly monitored.

Since our attention cannot be focused everywhere at once how do we ensure that these critical areas of our plan get the attention they require and deserve? We recommend that uniquely identified team accomplishments be designated for executing these strategies. VisiSuite encourages a risk code assignment that should track directly to your companies Risk Management Plan. That's not really enough either. The next step is to delineate the criteria that will verify the risk mitigation accomplishments and clearly identify them in the plan with the same coding. Once this is done, VisiSuite will automatically populate these risk codes into their associated work tasks so that the IMS clearly identifies all the accomplishments, criteria and detailed work tasks that will mitigate each serious risk. A large part of each periodic program review should be focused on filtered IMS displays

of the top risk mitigation plans. Its not enough to track progress, every aspect of that specific work plan should be questioned and refined or replaced if it's not reducing risk.

Conclusive Network Integrity

I talked a lot about how to achieve conclusive network schedule integrity in my previous white paper. Here I want to discuss how to use a high fidelity IMS to improve program performance. An excellent IMS will avoid negative surprises and keep the program team and its customer appraised of the true status of the program schedule. But it takes a little extra effort to improve program performance with the same IMS.

Breakthrough Logical Network Analysis

They say information is power. I would revise this to say proactive and accurate information is power. When you don't really know where your problems are until they confront you, you lose time, make errors, incur rework, compromise quality and increase program costs. When you know what your real problems are and when they will impact you, you probably will have little difficulty avoiding them.

So you need to hold frequent program review sessions with all the right people and use the VisiSuite Event Driven Schedule Analysis tool. It's not enough to view a stop light chart of when the major events will happen. What will really return value is to analyze the critical paths, near critical paths and comfortable paths to those events. When a team is told, early enough, what work is currently critical or could become critical soon, they can usually devise an effective way to avoid, or at least minimize program delays, re-work, and increased costs. "To be forewarned is to be forearmed" (Treatises of Fistula' (c. 1425) by J. Arderne).

The comfortable paths often present opportunities for reassigning resources in line with true schedule criticality. After all, that was the original premise that touted critical path method as an effective way to improve program performance. The key of course is accurate predictions but they must be recognized and acted upon in a timely manner to produce quantifiable results. It may be difficult to calculate the savings associated with avoiding serious problems, and satisfing our customer, but we can certainly quantify the savings of programs that complete early and under budget.

Lead the Horse to Water but Don't Let it Drink

Notice that I haven't talked about nailing RFP compliance, best practice performance metrics or any of the other VisiSuite features that will serve you well. They are important but this paper is specifically directed at how a plan-to-schedule process can provide real, quantifiable program performance improvements. Now I'll get brutally honest about what it really takes to realize these benefits.

Program Management Teams Return Value

Plans and schedules do not perform work on a program, people do. Great plans must be used be-

fore there will be real program execution performance improvements. I hate to say this but in many cases where we've produced excellent IMP/IMS products for our clients, they were never used to direct the efforts of the program resources. This has been particularly true in proposal situations. Let me illustrate this with a true story. I call it "The Tale of Two Program Teams".

The story took place in 2005, on behalf of an excellent major defense contractor. We performed two major, must-win proposal efforts on behalf of two different proposal teams. Both had formal IMP/IMS proposal submission requirements. Our client received exceptional scores for both proposals and ultimately was awarded both contracts.

One core proposal team adjusted the proposal IMP/IMS for the actual award date and period of performance, and used it to manage their program. That core proposal team became the program execution team that went on to execute their program in an exemplary manner. They had a sense of ownership for the plan and schedule because it directly reflected their thinking and decisions. They believed in the plan and knew it would work as long as it was actually used and maintained up-to-date. They were also willing to adjust their plan for scope changes and reviewed/revised it frequently as a team.

The other core proposal team was replaced with a new team and a new program manager. The second team discarded the proposal IMP/IMS entirely and replaced it with a much smaller schedule that they kept updated to report to their customer. In effect there was no real plan followed. The resources were not directed as to exactly what sequences they should perform their work tasks. Without going into detail, I'm sorry to report that the program execution was a disaster that cost the company credibility with a valued customer. I lost touch with the situation after a few months, so I can only hope that adjustments were made and perhaps some of our proposal planning was ultimately used to get the program back on track.

Summary

As much of this paper has explained, building an IMS from an excellent IMP can provide substantial program execution benefits. Integrated schedules that are not built from a plan were never designed to guide the work to be performed on the programs. It's the clever plan that's the lynchpin element of an IMP/IMS that can appreciably improve program performance.

The plan not only defines what work is to be done, more importantly it clearly defines how the work will be done. By delineating what each team must accomplish before an event will occur is the first step. The second step is to breakdown all of the criteria that each team accomplishment must achieve to verify that the accomplishment was completed. The critical consideration in defining accomplishment criteria is defining the precise sequence that they must be performed in. The sequence of the events, accomplishments and accomplishment criteria, defines how the work is to be performed.

As described throughout this paper, the considerations that go into defining this precise sequence are extensive. They include product/process development methodology, risk mitigation, deliberate deviations from standard product development processes and procedures, time-to-market considerations, and the right people agreeing on the very best plan for how to execute a specific program.

In summary, an excellent Integrated Master Plan will take additional time and effort to produce, but will demonstrably improve the quality and potential effectiveness of an Integrated Master Schedule that is a direct derivative of that plan. If the critical thinking of the key players and stakeholders is not embodied in the IMP it will likely never effect improvement during program execution. Smart program plans have a real potential to achieve smart program executions. Smart program executions produce successful programs and more competitive companies.

But a plan/schedule must be used to produce benefits. When the team that conceived the plan becomes the team that executes it, this will usually occur naturally, especially in excellent companies. Excellent companies will measure and reward a team leader's performance by comparing the actual work done by their team during execution to the original IMS. Planning and scheduling professionals perform a valuable service to a program team. But it's the program/proposal team that does the communicating, exercises expert judgment, reaches consensus and makes critical planning and risk mitigation decisions that determine the quality of the plan and its potential to improve program performance. If that team executes the program using their plan/schedule to manage the day-to-day work efforts, their company can expect real quantifiable performance improvements and the coveted consequences of an on-time, within-budget program that produces an excellent product/process and a satisfied customer.