

Visually Structured Planning White Paper

by
Joe Rizzo
Co-Founder
VisiSuite LLC

Introduction

The Visually Structured Planning Process stands on its own merits as a highly successful work group planning - facilitation technique. In fact its development predates the VisiSuite product by several decades. Simply stated, Visually Structured Planning employs pictures to focus the program planning process in a work team setting. The VisiSuite software was developed in 1997 to enhance the readability of the pictures, reduce the labor intensity associated with effective integrated scheduling and provide better Integrated Master Plan (IMP) and Integrated Master Schedule (IMS) analysis and presentation.

There can be little doubt that the effectiveness of the Visually Structured Planning Process is directly dependent on the quality of the workshop facilitation and schedule management techniques employed. This paper concentrates on those techniques. Most of the programs discussed were produced with the VisiSuite software, but many of the techniques described were developed long before the software.

The body of this paper begins with an overview of the process and a fairly thorough discussion about the IMP/IMS requirement that it supports. The work group planning workshop is introduced, along with traditional challenges, planning strategies and keys to success.

Visually Structured Planning Process Overview

Inception

The precursor to Visually Structured Planning involved a consulting assignment by this author, performed in 1983, to support the development of a major weapons system proposal. Over several rather frustrating months, I attempted to support this major planning effort, utilizing traditional project management methods. I naively expected to produce an integrated schedule of tasks, with network integrity that would reflect a workable approach (that could be realistically expanded into a reasonable contract schedule plan). What I actually produced was a very large schedule of semi-connected tasks that were subsequently “cost-ed” and submitted to the customer. I would be more than charitable to characterize the end result as a schedule that contained a reasonable level of network integrity.

When performing my own personal post-mortem, I identified all of the process shortcomings described in the following paragraphs. I also instinctively drew on my education in engineering and my early career experience in system software development to conceive a better approach. These ideas became the embryonic rudiments of Visually Structured Planning. Before these ideas are discussed, this paper will now define the problems that they collectively address.

Traditional Planning Process Shortcomings

Traditional methods generally share the following approaches:

- An individual or small team, I will call central planners, develops the entire plan.

- These central planners independently interview individuals or small teams of functional (or integrated product team) resources in order to develop the plan/schedule.
- The central planners attempt to integrate and reconcile the resulting “schedule fragments” into a composite schedule.
- Far more time and effort is expended to produce, or more correctly force, a schedule that reflects the desired completion dates rather than a composite schedule that reflects all of the real interdependencies between the teams interviewed.

Confusion

Major planning efforts attempt to develop a workable collective approach to how an organization can cooperatively design, develop and test a large complex product or process. One of the greatest challenges faced by the participants is “getting their arms around” all of the issues, challenges and inherent risks. Verbal discussions without some form of visual focusing (pictures and diagrams) are seldom very successful.

For this very reason, hardware/software design methods have extensively employed diagrams. In addition, the sketches and diagrams are invariably “nested” so that macro level diagrams are ultimately expanded into more detailed diagrams with considerable attention given to the interface between the macro-to-micro design diagrams (e.g. circuit diagrams).

Another important element of a complex system design is the practice of revising all the appropriate design diagrams as the system design evolves. Few would contest that these design diagrams are invaluable during the development of a complex product or process. Without those diagrams complex design and development efforts would be virtually impossible.

Developing a plan for how an organization can cooperatively execute a program/project contains all of the very same communication challenges as actually designing and developing a product/process. Without a pictorial representation of the plan, group-planning discussions are confusing at best and are often very unproductive. The planning team members end up having very detailed and circular discussions. When these un-focused discussions take place with different small teams at different times the problem is magnified. What often happens is one team says, “We can’t decide that until we know how the XYZ team is planning to handle it.”

Truth be known, central planners sometimes simply go through the motions of conducting planning sessions, then more or less “make up” the composite plan.

Different Takeaways

It’s pretty easy to understand that the above-described interviews often leave the participants with very different takeaways. Since there are no visual focusing or documenting diagrams used, the minutes of the meetings serve to capture the decisions made and the issues raised. Words alone provide a very imprecise means of documenting communications. This problem is further exacerbated by the lack of structure employed during the sessions. Since the discussions are often quite circular, the recorder is very challenged to capture what is actually being decided and often very

little is actually decided that can be recorded. What results is a situation where each small team has a completely different perspective about what has been decided. These discrepancies show up later during program execution as costly disconnects and un-synchronized effort. Many cost and schedule overruns can be directly traced back to these miscommunications and much finger pointing naturally follows.

The Endless Coordination Cycle

By far, the most frustrating experience that a sincere planner faces is the endless cycle of disagreement. Interdependencies between functional organizations and integrated product teams can easily number in the hundreds on a moderate size program. Traditional logic teaches the central planners to ask the receiving organization to define their needs in one planning session, and then coordinate those needs with the delivering organization in a separate session.

In practice however this does not often work out as intended. One problem is that the receiving organization can easily forget some of their needs during an unstructured and unfocused planning session. Later on, the central planners may be alerted to the forgotten need by the delivering organization. That requires them to return to the recipients to verify the need or call an additional meeting of both parties. Considering the hundreds (or even thousands) of such interdependencies that are involved, the central planner seldom has enough time to do this circular vetting process justice. To make matters worse there are often uncertainties and unresolved issues regarding who is responsible for doing the work or how the work should actually be done. Enough of these issues can make it impractical to attempt this type of fragmented interrogation.

Faulty Predictive Models

The primary expectation is that an Integrated Master Schedule will accurately predict when future events are scheduled to occur. This is a very reasonable expectation as long as the schedule administrator periodically updates the schedule with work completed and a reasonable estimate of when work-in-process will finish.

But, this expectation assumes that the predictive network schedule model is accurate and comprehensive. In my experience there are very few schedulers who are able to consistently construct a high integrity predictive network model using traditional tools and techniques. The best kept secret in project/program management may arguably be the quality of the network schedule models of moderate to large programs. Considering the number of dependency relationships that must be recognized and properly scheduled, the chances of a non-structured planning effort, impeded by the challenges described above, identifying all the necessary dependencies is not very high.

We have re-planned scores of significantly large and complex programs with Visually Structured Planning and VisiSuite. I can honestly say, that in every single case, the process has brought to light several critical missing dependencies and helped to refine faulty risk mitigation strategies.

Consequences

There is a dreadful thing in our business called a *negative surprise*. You probably know what I'm talking about already. It goes like this. A program that has been in process for a goodly time, has been predicting a rosy picture that all is well and the major events/deliverables are on schedule. Management and the customer are content and expecting a successful outcome. Then, just before a major delivery is due, suddenly management and the customer are given the dreaded *negative surprise*. **The program is actually in trouble and deliveries will be late.**

Truth be known, the problem is often a faulty predictive model that was missing one or more critical dependencies. It really only takes one incorrect or missing link to create this condition and provide the project team with an opportunity to spin a truly creative excuse to explain why we just realized the program is in trouble.

Introducing the Visually Structured Planning Process

Drawing on my engineering education and software development experience, I postulated that a more effective planning process would have to incorporate 7 lynchpin characteristics:

- A planning workshop approach must be used with all functional organizations and/or integrated product teams in attendance.
- A highly structured facilitation technique must be used that precedes top down (macro-to-micro).
- Clear and meaningful graphic images must be used to focus and document the workshop sessions.
- The information captured in the planning workshop must directly produce the integrated schedule structure and inter-organizational links.
- The completed integrated schedule must be extensively audited to ensure that "near absolute" workflow integrity is achieved and maintained.
- Best practices in risk reduction must be folded into the planning process and must be directly incorporated and tracked within the resulting integrated schedule.
- Planning diagrams and detailed schedules must be continuously synchronized during the planning and execution of the program.

Recognizing the essential process capabilities turned out to be much easier than devising the requisite practices. In 1984, I founded Computer Aided Management, Inc., which published a high-end (\$3,000) PC based project management product called "ViewPoint". ViewPoint won PC Magazine's "High End Project Management - Editor's Choice" award in 1989. The ViewPoint product was an early attempt to employ real-time pictures in support of planning. It was a good start, but the on-screen graphics were not up to today's quality standards so it did not demonstrate the true potential of Visually Structured Planning. Therefore, until 1997, I facilitated Visually Structured Planning workshops by hand-drawing pictures and later transcribing them into PowerPoint. It's easy to understand, that these hand-drawn pictures, were sometimes less than completely successful.

For the next 20 years, myself and my associates refined and applied Visually Structured Planning to the planning and management of large, complex, commercial product development, IT, and DOD projects. Over the last 12 years, I've been field developing and applying a very effective software application to the Visually Structured Planning process. Some 25+ years later and with the addition of VisiSuite, the full potential of Visually Structured Planning has been achieved. The Visually Structured Planning process has been consistently successful and has added measurable value to my clients' efforts.

The Visually Structured Planning Workshop Overview

The prime directive of the Visually Structured Planning Workshop is to proactively negotiate a collective agreement, across all functional organizations and/or integrated product teams that covers how they inter-depend and how they plan to synchronously execute the entire program (as outlined in the Statement of Work). Included in this directive are the recognition of critical work areas and the effective management of risk. The prime deliverable of the Visually Structured Planning Workshop is an Event-Driven; Integrated Master Plan (IMP) that embodies a stated agreement between contractor and customer covering the accomplishments that must be completed prior to moving on to the next major phase (or working on the next event) of the program. Another objective is the initiation and eventual development of a corresponding Integrated Master Schedule (IMS).

Two major challenges must be overcome. The workshop(s) must justify the expense associated with committing a program/proposal team to a workshop for several hours. The workshop must also be highly effective so that agreement is reached, and documented, on inter-team cooperation and strategies. If a preponderance of collective follow-up sessions is required to reconcile different perspectives then the Visually Structured Planning Workshop(s) did not meet its objectives.

Therefore, the workshop must be effectively structured and all the discussions must be successfully focused via meaningful pictures. Structured questions that modify living decision diagrams/collaboration roadmaps are the essence of the Visually Structured Planning Method. Of special importance is the mandate that the facilitator must guarantee that the participants understand what the diagrams symbolize and how they illustrate the collective decisions reached by the proposal/program team.

Visually Structured Planning Applied to IMP/IMS

Before discussing the Visually Structured Planning Method in more detail, let's look at how it relates to composing an IMP and IMS.

The Integrated Master Plan - IMP

The following description of the IMP requirement was extracted from an ASC Preparedness Handbook write-up dated 17 Aug 1995 (downloaded from the Defense Acquisition Deskbook 28 February 2002- Web site). These quotations remain in full alignment and compliance with the Department of Defense, Integrated Master Plan and Integrated Master Schedule Preparation and Use Paper, Version 0.9 published on October 21, 2005.

Definition

“The IMP is a program event plan that provides top level control and progress management to any type of effort. It intends to capture all work effort required of a program at a top level. There should be sufficient definition to track step-by-step completion of required accomplishments and the completion criteria for each accomplishment.”

Salient Features

“The IMP is an event oriented plan representing the structure of the program. It measures program maturity by marking the initiation or conclusion of major intervals of program activity. It is the structure of events that sequentially organizes all major tasks required to complete a specific program. The structure allows the highlighting of critical areas to properly manage risks.”

“The IMP is not tied to the calendar. The IMP should cover all key events of the program. It provides the basis for all subsequent detailed program planning.”

“An IMP includes the events, accomplishments, and accomplishment criteria structure for the program. A numbering scheme to be used throughout the IMP/IMS should be included which relates to other program documentation such as the WBS, SOW, and specifications.”

“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.”

“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.”

“Accomplishment criteria are measurable and useful indicators that demonstrate the achievement of maturity/progress in an activity or accomplishment has been achieved.”

I should point out that a government contractor developing a proposal would most likely think of the IMP as a collection of program management and technical process write-ups and not in the terms being discussed in this paper. In the strictest sense, this paper is correct, per the Preparedness Handbook quotations, but when a Pink Team or even a Red Team evaluate an IMP, they will probably be focusing on the program management and technical process descriptions, rather than the more technical event/accomplishment/criteria tables. In fact, this paper refers to creating an IMP then an IMS in the strictest technical sense of the terms, rather than the way they are generally understood by a proposal team.

The Integrated Master Schedule - IMS

The following description of the IMS requirement was extracted from an ASC Preparedness Handbook write-up dated 17 Aug 1995 (Defense Acquisition Deskbook 28 February 2002- Web site).

Definition

“The IMS is an integrated and networked multi-layered schedule of program tasks. The IMS is directly traceable to the IMP and other program documentation, e.g., Work Break-down Structure (WBS), Statement of Work (SOW), Cost Performance Reports (CPR), Acquisition Program Baseline (APB), etc.”

Salient Features

“The IMS is the integrated schedule of the program. It is used for identification of problem areas, both during program planning and execution, and to help define priorities for management attention and action, particularly as problem areas develop and are identified.”

“The IMS is the tool that provides the detailed tasks and timing of the tasks that support the work effort the IMP delineates. It supports all the criteria, accomplishments, and events of the IMP. “

“All of the accomplishments and criteria in the Program IMP will be broken down into tasks for the Program IMS. The team responsible for accomplishing each task should develop the Program IMS”.

“The IMS ties them together by showing their logical relationships, any interrelationships between pieces of work, and any constraints that control the start or finish of each piece of work. Thereby, the IMS becomes the source that depicts the planned dates when each event is expected to occur as well as all the expected dates for all work done to get to the event.”

The Integrated Master Schedule - Event Driven Scheduling

The following description of the event Driven Scheduling requirement was also extracted from an ASC Preparedness Handbook write-up dated 17 Aug 1995 (Defense Acquisition Deskbook, 28 February 2002- Web site).

Definition

“It is this “completion of events prior to moving on to new events” that differentiates an Event-Driven program from a schedule-driven program. Program teams need to jointly agree, before contract award, through the use of the IMP, what will be accomplished prior to each event. Then, only hold the event at the point when all of the agreed-to supporting accomplishments with criteria are completed. This provides the basis for an Event-Driven program. The program clearly progresses from one event to the next, giving decision makers the knowledge that the event has not only occurred, but all of the associated work has been successfully completed.”

Visually Structured Planning Support of IMP/IMS

Now let's look at how VisiSuite applies Visually Structured Planning to support the development of an IMP/IMS.

Planning Charts

Microsoft PowerPoint charts are drawn, real time, during the first phase of the Visually Structured Planning Workshop that graphically depict all the program's events, Major Work Efforts and accomplishments. The charts are nested to keep them clear, readable and to represent various levels of detail. These charts graphically depict the sequence of events and their required accomplishments. As the Planning Charts are developed, the required accomplishment criteria is also captured (in the VisiSuite database). This process automatically generates the full range of IMP coding requirements (and saves them into the VisiSuite database).

As sections of the IMP are completed, VisiSuite generates Microsoft Project "Shells" that contain all the defined events, accomplishments and criteria for that program element ("Local Project"), along with the automatically generated coding structures. The *interface* accomplishments that link each Local Project with the entire Program are also automatically generated. In this way, the IMP directly generates the structure and starting content of the IMS, and the various Local Projects that can be "integrated" (via VisiSuite) into a composite IMS. Best of all, the critical cross-team dependencies defined during Visually Structured Planning are automatically and precisely incorporated into the IMS.

IMS Schedule

Whereas, the IMP is generated in the Microsoft PowerPoint environment, the completion of the IMS occurs in the Microsoft Project environment. The primary effort involves adding the necessary detailed tasks, estimating their durations and linking them with the criteria, accomplishments and events defined within the IMP.

For flexibility, VisiSuite allows completion/revisions to accomplishment criteria to be done within the Microsoft Project environment (as well as the Microsoft PowerPoint environment). Most importantly any revisions made to the IMP or IMS are automatically "synchronized" by VisiSuite to ensure that the two products are completely in line with and traceable to one another.

Event-Driven Scheduling

Visually Structured Planning supports Event-Driven Scheduling by supporting the development of an Event-Driven IMP. In addition, VisiSuite tools in the Microsoft Project environment provide breakthrough schedule audit and analysis capabilities. These unique tools greatly enhance traditional scheduling techniques to assure mechanical schedule integrity, logical schedule integrity and provide extremely friendly tools for analyzing and "scrubbing" the IMS.

Predictive Models with Integrity

VisiSuite's "Event-Driven Schedule Analysis Tool" is central to ensuring that the IMS provides a high integrity predictive scheduling model. VisiSuite, literally tests each work team accomplishment (by temporarily delaying it) to ensure that, if the accomplishment slips, the corresponding event will

properly reflect that slippage. Therefore, any incorrect or missing links are identified and corrected before the IMS is implemented.

In addition, this analysis provides a “relative slack” factor for each work team accomplishment that quantifies how many days it can slip before it will impact the delivery of its associated event. Knowledge of critical path, near-critical paths and schedule “fat” are invaluable aids to intelligent resource assignment and the proactive development of “work-around-plans” that will avoid event delays.

Improved Predictions and Performance

Visually Structured Planning ensures a thorough recognition of inter-team dependencies and effective work team risk mitigation strategies. The planning charts quickly become invaluable internal/external communication tools during planning and execution. VisiSuite directly produces the macro level IMS thereby ensuring that these critical relationships are accurately replicated. VisiSuite also arms the scheduler with breakthrough schedule audit and analysis capabilities that further ensure the fully detailed IMS is properly constructed and will provide reliable schedule predictions. The plan-to-schedule approach embodied in Visually Structured Planning also facilitates the incorporation of best-practice quality control and risk management practices. Finally, this highly effective work planning method builds consensus, cooperation, confidence and a sense of ownership across the program team. Bottom line, If you choose to employ Visually Structured Planning as enabled by VisiSuite, you will benefit from precise performance predictions, improved project coordination/communication, and improved project performance.

Summary

The Visually Structured Planning process is a consistently successful work group planning technique that utilizes clear meaningful pictures to focus program planning. Clear, professional-quality visuals are used to cut through the complexity of ideas being presented, negotiate agreement and keep participants on the same page. This process unfailingly overcomes the shortcomings of traditional methods like confusion, inconsistent understanding and endless coordination by incorporating 7 lynchpin characteristics:

- A planning workshop approach with all functional organizations and/or integrated product teams in attendance.
- A highly structured facilitation technique that precedes top down (macro-to-micro).
- Clear and meaningful graphic images focus and document the workshop sessions.
- The information captured in the planning workshop directly produces the integrated schedule structure and inter-team links.
- The completed integrated schedule achieves “near absolute” workflow integrity.
- Best practices in risk reduction are folded into the planning process and directly incorporated and tracked within the integrated schedule.
- Planning diagrams and detailed schedules are continuously synchronized during the planning and execution of the program.

Structured questions that modify living decision diagrams/collaboration roadmaps are the essence of the Visually Structured Planning Method and accounts for its consistently exceptional results.

The development of a formal government IMP can be thought of as a means to the end of developing a fully integrated master schedule. With a full up IMP/IMS requirement, the IMP is certainly an extremely important product and so is the IMS. **I also believe that the very best way to develop an excellent IMS is to employ a full up IMP/IMS methodology even if the IMP will not be included in the actual proposal.**

In fact, when developing a commercial integrated schedule I use exactly the same Visually Structured Planning process but I simply relax the requirements for references and data deliveries. I almost always however, develop a simple but comprehensive work breakdown coding structure and I definitely define teams (though I usually just call them work teams and not Integrated Product Teams).

I've been developing plans and schedules professionally for over three decades. Over all that time I've passionately embraced three methods:

1. Visually Structured Planning
2. Developing an Integrated Master Plan as the foundation for an Integrated Master Schedule
3. Work Group Planning Sessions followed by one-on-one detailed schedule development interviews.

I can certainly construct a decent schedule for a small project without employing the above methods but I have and will refuse to tackle any project scheduling requirement that involves multiple teams developing a complex product or process over a period of months or longer without the benefits of the above methods and the VisiSuite product. The smallest IMS that I've created "my way" required less than 30 detailed activities and the largest close to 50,000 activities. All have benefited from the Visually Structured Planning and VisiSuite. Frankly, once you experience the full benefits of Visually Structured Planning with VisiSuite, you'll likely never return to conventional methods and tools. It's just an easier, faster, surer way to do the job and achieve consistently excellent results.