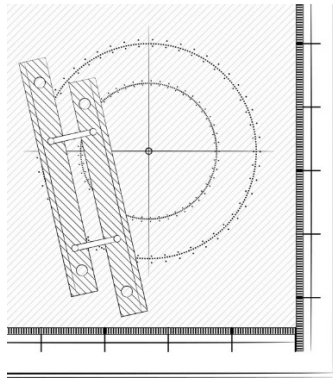


JEREMIE AVEROUS

With Thierry LINARES

Advanced Scheduling Handbook for Project Managers



A Practical Navigation Guide
on Large, Complex Projects



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Foreword

by Jean-Marc Aubry

In the Oil and Gas business as in industrial projects, the shareholders, investors and Clients are increasingly requesting fast-track schedules and fast completion of Projects. The objectives are to optimise their financing costs and conditions, satisfy the market and their own Clients, benefit of competitive advantages, help them to reduce the pay-back as much as possible and keep their leading positions.

Today, all Parties including Contractors are facing very difficult schedules and related complex strategies to meet these objectives. The risk-taking has increased, the floats are disappearing and any delay is a disaster for the Contractor, his direct Client and the shareholders.

Still around 20 years ago, we were working on sequenced phases: engineering, procurement, construction, start-up and Operations (EPC), where nowadays people are more and more dreaming of CPE...

I like to take the story of the driver leaving for a long journey by car. Either he jumps in the car, with the map on the side seat and tries regularly to look at his way, or he spends a bit of time to study ahead the best route, combining estimated time, distance, highways and gasoline costs, safety aspects, anticipating traffic jams... Both will arrive at their final destination. The first one with no control on his journey and constant pressure, the second one will arrive on time and at the best satisfaction and safety of his passengers.

This illustrates perfectly what scheduling and planning are for a Project.

For some people, the schedule is a thick Primavera document, established by the Scheduling department, and that nobody understands or looks at.

For the experienced Project Director, it will be the perfect translation of his Project strategy. It will contain his analysis of the risks and the corresponding mitigations, the floats he can anticipate, the contractual approach he has to implement, the key milestones he has to meet to secure step by step his Project schedule-wise but also budget-wise.

Out of a full booklet of detailed schedules, he will be able to extract a simple document, with key milestones and critical paths, which will help him drive his Project to the right end, anticipating any disturbance by the proactive actions he will be able to implement.

To establish such a route book, the Project Director counts on his most critical partner who is the Schedule Manager, able to understand the strategy of the project, the risks, and develop, thanks to a large experience in this ‘Science’, the right itinerary.

This partner will also be the ‘Master of the Temple’, alerting, simulating, evaluating alternatives, to continuously help to stay on the road.

The authors have become this kind of Master, building a very rich experience in this crucial domain, continuously looking for improvement and creative approaches, which are the key of a successful Project.

I have been very honoured to write a few words for this handbook, our experience on the Yamal Project is not only a professional journey, but also a personal and high value cooperation based on trust. Very few people have developed a so deep understanding of their role and mission. This may be what we call simply professionalism.

Thanks for this very interesting analysis which will benefit to the profession.

Jean-Marc AUBRY
Yamal Project – Fellow Executive Project Director
Previously President, Technip France

Introduction to Project Navigation

Why Project Navigation?



A Project is like an intercontinental sailing expedition. When executing a Project, one needs to define the goal and a plan to reach it; and then, fit out a vessel with the appropriate quantities of fuel and supplies to last for the long voyage, and finally, recruit the right crew.

The days are long gone of the adventurers that cast off without any idea of goal or direction – that may still exist in some R&D contexts but very rarely in the context of Large, Complex construction Projects.

When the vessel has finally left the shore to begin the uncertain voyage towards a new continent, left to the forces of the sea, the currents and the winds, there are three fundamental navigation questions that require an accurate response, on a regular basis:

- Where are we?
- Where are we heading to (if we continue according to the present trend)?
- What adjustments do we need to do to come back on course?

The result of these three questions leads to a decision that needs to be taken consciously - in the present circumstances, whether or not to amend the current course of the vessel, or the sails' configuration. Proper navigation and decision-making are intertwined.

Our experience in consulting for Large, Complex Projects shows that a large percentage of the Project organizations –half of them maybe– cannot even respond adequately to the first question (‘where are we’). They fail to have adequate monitoring tools and information gathering processes that would give them an accurate picture of the actual status of the Project. As a result, they take navigation decisions on the basis of inaccurate status information!

Our experience shows that many Large Projects don't know exactly where they are; and in the remaining projects, a large proportion can't fully forecast where they are going.

Then, amongst those other organizations that succeed in maintaining accurate status data, another large proportion are not able to identify and extrapolate the observed trends and determine how much they will deviate from the initial navigation plan if they were to continue unimpeded. Even more so, when seeing a storm form on the horizon, many Project Managers today are at a loss to take the right decisions to react to it by changing course or changing the sails' configuration. This lack of capability for anticipation has thrown many sailors helpless on chartered reefs, and continues to do so in the realm of Project management.

Today, automated systems on ships and aircrafts still do constantly implement small course corrections based on the same three questions so as to reach safely their destination. These automated systems are able to respond to small perturbations but human monitoring is still required for the management of large and unexpected changes. Actually, the issue today is still to teach Captains the basics of good ol' navigation so that they understand what is important and where and how automated systems can support - and where they find their limits.

In the field of Project Management, we observe that Project Managers today have sometimes taken a back seat behind those terrific scheduling systems that seem to promise full control on all events happening on the Project, like a GPS. This is an illusion – those systems are generally

not well implemented, and not properly used. They have intrinsic limitations that are not well understood. Most successful Project Managers today still fly by the seat of their pants and smell the sea to navigate prudently. However these experienced hands that started their career scheduling manually on paper will soon be part of the heroic history of Project Management, and the newer generations seem to have lost the feeling for the reality of actual Project navigation.

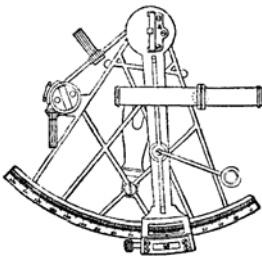
It is the ambition of this handbook to re-establish the basics lost in time of Project Scheduling for today's Project Managers. Automated tools can have great power when one knows how to use them properly and understands their limits, and they should be used to leverage what can be achieved – but in no case can they replace the sound judgment and experience of Project Managers.

There lies the ambition of this handbook – a Navigation Handbook for the Project Managers of Large and Complex Projects of modern times.

A Practical Handbook

This handbook has been specifically written in the particular context of Large and Complex construction Projects.

This handbook does not intend to be a 'starters' guide to Project scheduling as it tackles advanced topics. It does not cover, in particular, the basic technicalities of scheduling, but concentrates on the perspective of Project Management's check and usage of schedule as a decision-making tool. In other words, it concentrates on how the Captain should use the navigation process to reach the destination safely – but will not describe the sometimes tedious navigation calculations.



We will use historical sailing ship navigation instrument drawing such as the one on the left to highlight those sections that refer to the principles of navigation.

Those sections will form a thread running throughout the entire book, where traditional navigation tools and processes will be quoted as a useful metaphor to put the concepts in perspective.

Our intent is that well worn-out copies of this navigation handbook will be found on every Planner's, Project Control Manager's and Project Manager's desk.

The Handbook's Structure

Chapter 1 covers a number of sound Scheduling Golden Rules that summarize key principles that are essential to proper Project schedule management. All those concepts are developed in this handbook.

Chapter 2 describes the best practice in terms of the set of different schedules (the '*schedule hierarchy*') needed to support the execution of Projects, for any size or complexity. Essential pieces are the Convergence Plan and the Integrated Project Schedule. Chapter 3 and 4 describe best practices for building these two central components.

Chapter 5 and Chapter 6 give key insights for Project Managers to check the quality of schedules and improve them prior to, and during Project execution. Chapter 7 covers in particular what insights can be drawn from Schedule Statistical Analysis.

Chapter 8 and 9 describes the best practices for the central scheduling processes during Project execution: updating and re-forecasting.

Chapters 10 to 12 cover advanced topics related to Project scheduling:

- Ensuring sufficient agility of the Project Schedule to face the inevitable changes,
- Introducing the concept of schedule buffer as a way to create more realistic and manageable Project schedules,
- Explaining the basics of how to use the schedule for contractual purposes, in particular in cases of request for Extension of Time.

Finally, Chapter 13 summarizes how to assess effectively the quality of the Project Scheduling process. The Chapter contains a number of easy-to-use reference checklists for Project reviews.

Topics Not Covered in this Handbook

This handbook is focused on the practice of Project Scheduling during Project execution. The following topics are not covered in this handbook:

- Technical use of scheduling tools/software,
- Basic scheduling concepts,
- Quantity surveying,
- Duration estimating (at studies phase or during Project execution for changes).

Who Is This Handbook For?

This handbook is explicitly for Project Sponsors, Project Managers, Project Control personnel (in particular Planning Managers and Leads) and all those who aspire to become Project Managers; Budget Owners within Projects (Package Managers, etc.) as well as functional managers that are involved in scheduling and resource planning.

This handbook has been primarily written from the perspective of the Project Manager or Project Management Team, who use schedules to take decisions in action. It is quite different from the usual perspective of schedule professionals who are sometimes centred on the excellence of their tools' usage. This handbook thus differs markedly from most books on project scheduling. By taking this different point of view, we believe that this book will fill-in a much needed gap between Project management and Schedule professionals and create useful conversations in organizations.

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Our products are directly related to our three pillars. We have developed proprietary methods and tools to deliver the results that are needed for Large, Complex Projects. In a number of areas, they are significantly different from those conventional Project management tools used for simpler Projects.



We focus on consulting, coaching and training interventions where we come in for a short to medium duration, analyze the situation, develop customized tools if needed, and transfer skills and methods to our clients so that they can implement them in a sustainable manner.

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