

The Roles and Attributes of a Scheduler

The Three Roles of a Scheduler

The roles fulfilled by a scheduler change as the project progresses through its life cycle from a concept, to a definite 'job', to a 'work in progress'. In PMBOK terms, the three phases are:

- Pre-initiation (commitment / feasibility planning),
- Initiation and Planning (execution scheduling) and
- Executing and Monitoring & Controlling (performance control).

In each role the scheduler's specific skills are his/her ability to:

- envision the shape and flow of the project's work in '4D' – the three physical dimensions + time. This is important in both soft-projects (how the work fits together) and hard-projects (how the elements fit together),
- synthesise information from disparate sources into an integrated and 'sensible' schedule,
- analyse and validate this preliminary schedule against the overall project objectives,
- work with the project team to optimise and refine the schedule (with the scheduler using his/her special skills to identify and suggest options, test 'what-if' scenarios, etc) until an agreed schedule has been developed,
- effectively communicate the outcome of the schedule development (or update) process by presenting targeted and relevant information from the schedule in elegant and effective formats; ie, reporting the right information to the right stakeholder at the right time!
- assist the various project stakeholders, and in particular the project manager, understand and manage the project from a time perspective.

Planning -v- Scheduling

Project planning and scheduling, although they are allied disciplines, are not the same. Project planning is a team operation involving the management team, cost control team, design team and project planner in creating the project development strategy. Whereas scheduling is a mixture of art and science, involving the interpretation of the results of project planning by using appropriate software tools and techniques to ascertain, amongst other things, the start and finish dates of activities and their sequence. During the three phases outlined above, virtually all of the effort in commitment planning is devoted to the planning function; whilst execution scheduling completes the planning process and starts the scheduling process which continues during performance control. It is not good practice to plan the work while attempting to schedule it.

Project planning involves the scheduler working with the project leadership to make decisions concerning:

- the overall strategy of how the work process is to be broken down for control;
- how the control is to be managed;
- what methods are to be used for design, procurement and construction;
- the strategy for subcontracting and procurement;
- the interface between the various participants;
- the zones of operation and their interface;
- maximising efficiency of the project strategy with respect to cost and time;
- risk and opportunity management.

After planning, the scheduler should work with the people responsible for executing the work to determine:

- the duration of the activities;
- the party who will perform the activities;
- the resources to be applied to the activities;



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- the method of sequencing one or more activities in relation to other activities, and
- communication and reporting formats, timing, etc.

Skilled schedulers can fulfil both of these functions and all three roles defined below, trainee schedulers normally start in a 'monitoring and controlling' role, then progress to developing the execution schedule (initially under supervision), where they acquire the skills and experience needed to be effective in the 'Commitment Planning' role. For more on this section see 'Faster Construction Projects with CPM Scheduling by Murray B. Woolf (p107¹)

The three roles of a scheduler are:

- **Commitment Planning** (Feasibility Planning). Information is scarce, the scheduler works with the project bid team to 'paint a time picture' of the project, develop a strategy for delivery and gain consensus. Generally the scheduler is the key 'time management expert' in this phase of the project.
- **Execution Scheduling**. Developing the agreed project implementation schedule. The scheduler is now in a facilitating role assembling information from the project team (and frequently sub-contractors). The information is 'owned' by the project team. The scheduler's role is to integrate and test the information provided by the team for logic, common sense and completeness by asking the right questions. The scheduler remains totally responsible for the integrity of the scheduling tool and the schedule data (or project schedule model).
- **Performance Control**. During the execution of the project work the scheduler is in a support role; he/she maintains the schedule, optimises change outcomes and advises the project team on performance. The status and update processes are the mechanism by which the scheduler maintains the schedule model and influences the project team². The scheduler should be alert to changes, variations in scope and trends that may influence project outcomes and advise the project management team of his/her observations, findings and recommendations.

As the project and its schedule evolve through these three phases, the core attributes of 'good scheduling practice'³ remain unaltered. The key differences are in the appropriate level of detail to be incorporated in the schedule, the degree of certainty that can be attributed to the estimates used to develop the schedule and the role played by the scheduler.

The Scheduling 'Value Proposition'

A skilled scheduler will add value to the project team in a number of ways. The emphasis will shift as the project progresses through its life cycle but all four elements of the 'value proposition' discussed below remain relevant through to project closure.

Project and Process Facilitator

The Scheduler's role of facilitator begins with the processes involved in creating and establishing a project, and then at all stages of the project through to completion. The scheduler need not know the technical details of every aspect of a project, but his/her job involves talking to and questioning all of the key stakeholders and drawing all of the different areas of specialist knowledge into one cohesive, interrelated whole. Essentially the scheduler is responsible for designing an effective time envelope for the project in exactly the same way an Architect would design a physical envelope of a building that meets the needs, aspirations and constraints of the project team and their key stakeholders. However, unlike some Architects, the project scheduler should remain the 'servant' of the project team using his/her skills to meld their ideas and aspiration into a coherent, logical and feasible project schedule.

Philosopher Friedrich von Hayek argues all knowledge is partial and the closest you can get to the truth comes from the aggregation of as many partial understandings as possible. The Scheduler facilitates the exchange, sharing and aggregation of knowledge from all of the disciplines and areas involved in the project to develop and then

¹ For more information see: <http://www.mosaicprojects.com.au/Books.html#books>

² For more on updating, see 'Managing for Success - The power of regular updates' by P. Weaver: www.mosaicprojects.com.au/Resources_Papers_002.html

³ See 'A Guide to Good Scheduling Practice': http://www.mosaicprojects.com.au/PDF/Good_Scheduling_Practice.pdf



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disseminates the most complete understanding of the time planning and management aspects of the project. He/she is able to let different areas know how their work and plans fit in with other areas, enabling work to flow smoothly across the project. As well, the Scheduler is uniquely positioned to advise the project manager and team on ways to avoid potentially costly conflicts between different areas and to facilitate the allocation and sharing of resources across the project. The Scheduler becomes the forward looking, eyes and ears of the project team.

Time Budgeter

All organisations are familiar with the concept of budgets. These are a fundamental method by which we keep track of and manage cash inflows and outflows. One of the Scheduler's key responsibilities is to develop and manage 'time budgets' - to work with the project team to estimate the overall duration of the project and each of its components. The project Execution Schedule identifies the critical path for a project and helps ensure that work flows in the most efficient and cost effective manner and is accomplished in adequate time to allow for completion dates to be met.

Risk Minimiser

Many projects have a built in penalty clause that provide for the payment of, often considerable, 'liquidated damages' if the project is not completed on time (and even without 'LDs', the cost of time over-runs are substantial). The Scheduler can assist, at the start of a project, to ensure that realistic, achievable end dates are established, and that target dates are set and met throughout the duration of the work; so that the end date remains attainable. Similarly, he/she can provide early warning if areas of the work are slipping behind schedule and can assist in advising the project manager on the optimum reallocation of resources to enable late work to be caught up. Adequate and effective planning is of prime importance in any project risk minimisation process.

Cost Saver

The Scheduler is a key player in the optimisation of costs. Many projects remain profitable, or viable, only if they are completed on time. Any number of factors can mean that a late project is a loss project; and reducing the risk of time blowouts is a sure way to save money. A competent Scheduler can foresee risks and advise on appropriate actions to avoid or minimise them ahead of time. The role of a the Scheduler is of immense value to any project as an 'ideas person' at the time the project is being conceived, developed, planned and set up, through monitoring and controlling the execution of the project to optimise performance. In short, the Scheduler should become an integral part of the Project Management team.

How many schedulers?

A competent Scheduler supported by professional software should be able to develop and maintain schedules totalling approximately 2,000 to 2,500 activities per scheduler. This is driven by the scheduler's ability, the nature, complexity and length of the project(s). Currently, schedulers are being stretched to the limit; the number of activities per scheduler is more likely to average 5,000 or more with an inevitable reduction in the quality of the work (estimates by Dick Faris, co-founder of Primavera).

Characteristics of a Scheduler:

To fulfil the roles and deliver the 'value proposition' outlined above, schedulers need to be pro-active and constructively inquisitive; continually seeking to understand, clarify and explain the scope of 'their project' and the dynamics of the work flow and the project team they support. They have the courage to 'paint a time picture' of the project when details are scarce or almost non-existent and then willingly update and modify their starting point as more information becomes available. When 'filling gaps' or creating an overview, the scheduler is totally confident in his/her ability and knowledge. But as 'real information' emerges, and/or the project team members become more familiar with the project and start to develop their own ideas, the scheduler is happy to defer to the team members opinions and views; testing the validity of their ideas with questions but always acknowledging it is the project manager and project team who are responsible for delivering the schedule.

Tom Peters has identified the eight paradoxes of project management. These have been adapted to the role of a scheduler:



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| <p>1. Total Ego
Confident in his/her ability as a scheduler and having the right to make demands of people.</p> <p>2. Autocrat
Decisive and authoritative where necessary to protect the integrity of the schedule.</p> <p>3. Leader
Has a vision of the future and inspires people to develop the best possible schedule.</p> <p>4. Comfortable with Ambiguity
Projects are surrounded by ambiguity. Recognises that searching for exactitudes causes paralysis.</p> <p>5. Good Face-to-Face Communicator
Builds rapport with people. Confident and persuasive in briefings and meetings.</p> <p>6. Unfazed by Complexity
Recognises the direct route is not always the best one. Can deal with the complexities of scheduling software and the project</p> <p>7. Aware of the 'Big Picture'
Is able to take account of the project's environment: political, economic and/or business.</p> <p>8. Impatient
Drives to overcome resistance and achieve results.</p> | <p>No Ego
A team player - does not pull rank. A true servant of the project manager and team.</p> <p>Delegator
Encourages team members use their knowledge and 'own' the schedule model (data inputs, outputs, etc).</p> <p>Manager
Manages the nuts and bolts of the schedule tool and schedule development process</p> <p>Obsessed with Precision
Some things require precision. The scheduler understands what these are.</p> <p>Good Communicator in Writing
Has the discipline to write things down and ensures the paperwork is kept up to date.</p> <p>Likes to Keep Things Simple
Recognises simple solutions work most of the time. Can create an accurate overview of the whole project. Only adds 'sufficient detail' not too much!</p> <p>Pays Attention to Detail
Pays attention to the small but vital components that are the difference between success and failure.</p> <p>Patient
Listens to team members and stakeholders.</p> |
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Core Competencies of a Scheduler:

Schedulers also need core technical skills including being:

- Good with data;
- Concise and accurate in their work;
- Capable of learning how to use a scheduling software tool
- Competent in the development of CPM schedules and aware of their limitations
 - i. Developing 'dynamic schedules'⁴
 - ii. Aware of inherent limitations in the CPM modelling process⁵

Some of the key processes the scheduler needs to be competent to support include:

- Determining the duration⁶, effort, sequence⁷ and dependencies of tasks as the basis for the project schedule (Based on the project scope and involving inputs from the project team).
- Applying appropriate methods, techniques and tools to create the project schedule and time management plan⁸.

⁴ See: *Dynamic Scheduling* downloaded from: www.mosaicprojects.com.au/Planning.html#Roles

⁵ See: *Links, Lags & Ladders* downloaded from: www.mosaicprojects.com.au/Planning.html#Roles

⁶ For more on duration estimating see '*The Cost of Time - or who's duration is it anyway?*' by P. Weaver: www.mosaicprojects.com.au/Resources_Papers_009.html

For more on the factors causing uncertainty around the calculation of the 'critical path' and the overall schedule see '*Float - Is It Real?*' by P. Weaver: www.mosaicprojects.com.au/Resources_Papers_043.html

⁸ For more on good scheduling practice see:

- '*A Guide to Scheduling Good Practice*', downloaded from: www.mosaicprojects.com.au/Planning.html#Roles
- '*PMI Practice Standard for Scheduling*', for more information see: www.mosaicprojects.com.au/Books.html#PMI
- '*Standardising Quality in Project Scheduling*', downloaded from: www.mosaicprojects.com.au/Resources_Papers_071.html



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- Ensuring the project schedule includes all tasks and activities necessary to achieve the scope and objectives of the project.
- Balancing the time objective of the schedule with resource and cost constraints to develop an optimum solution and agreeing the solution with the project team.
- Undertaking various resource levelling, smoothing and optimizing processes, usually assisted by the scheduling software tool, to meet project objectives. Including having a thorough understanding of the limitations of the techniques and the algorithms and options embedded in the selected scheduling tool.
- Integrating the schedule and risk management systems to ensure all planned mitigation activities are properly incorporated into the schedule (including having an appreciation of the overall risk management processes).
- Integrating the schedule and Earned Value management systems to provide the effective transfer of data from the schedule to the EVM systems schedule (including having an appreciation of the overall Earned Value management processes).
- Ensuring that the scheduling software tools are used correctly (and that the scheduler has been adequately trained in their use⁹).
- Gaining approval of the project schedule from stakeholders¹⁰ and assisting the project manager to gain approval from higher project authorities.
- Reviewing the software tools in use for their continued relevance to meet project objective(s), including making appropriate recommendations as needed¹¹.
- Implementing and using mechanisms to measure, record and report progress of activities in relation to the agreed schedule and plans¹².
- Regularly analysing options to identify variances and forecast the impact of changes on the schedule.
- Communicating effectively with all relevant stakeholders regarding schedule status, risks, trends, etc¹³.
- Reviewing progress throughout the project life cycle and maintaining the schedule to ensure consistency with changing scope, objectives and constraints related to time and resource availability.
- Developing responses to perceived, potential or actual risks and/or schedule changes, obtaining agreement/approval to changes where necessary, and implementing them to meet project objectives.
- At project completion, review the project outcomes to determine the effectiveness of the time management activities, including:
 - Helping identify, document and pass on time management issues and submit recommend improvements to higher project authority for application in future projects.
 - Helping identify lessons learned and pass to higher authority for application to future projects

Project Planning & Scheduling – Management roles:

Project Controls Manager: Manages and oversees the project control functions. Responsible for project planning and scheduling, cost estimating and monitoring, and quality review. Leads and directs the work of others and performs a variety of tasks including:

- Managing the project controls personnel.
- Establishing operating policies to mitigate risk.
- Providing guidance and consultation to project managers.

⁹ For more on training see: www.mosaicprojects.com.au/Training-PMGen%205-STEPS.html

¹⁰ For more on managing schedule stakeholders see 'Stakeholder Centric Scheduling' by Dr. L. Bourne: www.mosaicprojects.com.au/Resources_Papers_049.html

¹¹ For more on the effective use of tools for project governance see 'Effective Project Governance – The Tools for Success' www.mosaicprojects.com.au/Resources_Papers_034.html

¹² For more on updating, see 'Managing for Success - The power of regular updates' by P. Weaver: www.mosaicprojects.com.au/Resources_Papers_002.html

¹³ For more on effective communication see 'Getting the 'soft stuff' right - Effective communication is the key to successful project outcomes!' www.mosaicprojects.com.au/Resources_Papers_055.html



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- Familiar with a variety of the disciplines concepts, practices, and procedures.
- Relies on extensive experience and judgment to plan and accomplish goals.

Project Services Manager: Manages all aspects of Planning, Cost Management, Procurement, Document Control and Risk Management including techniques, systems, staff, training and development, in order to provide the company with an efficient and professional project services capability. This role demands the leadership ability to cascade vision, objectives, and goals within the Project Services function including supplying support, mentoring and development of Project Services staff.

Project Planning & Scheduling - Credentials and Training:

PMI-SPSM Scheduling Professional Credential - PMI's credential for professional schedulers. For more information on the credential and Mosaic's PMI-SP exam prep course options, see: <http://www.mosaicprojects.com.au/Training-Planning.html>

CIOB (UK) Time Management Qualifications - the CIOB has launched a three level scheduling certification structure supported by authorised training. Mosaic is an authorised CIOB trainer. For more information on the Time Management credentials and our training courses, see: http://www.mosaicprojects.com.au/Training-CIOB-TM_Credential.html

'How To' Develop an Effective Schedule - These workshops are designed to build and maintain a positive stakeholder consensus using the power of pro-active 'dynamic scheduling' to build and foster a strong team commitment. Based on the PMI Practice Standard for Scheduling and the CIOB Guide to Good Practice in the Management of Time in Complex Projects, the workshops focuses on effective schedule planning and control techniques. These courses are designed for people who already know how to use a scheduling tool and wish to move their practice to a more advanced level focused on achieving positive outcomes. The workshops can also form the initial classroom phase for both the PMI-SP and CIOB PTMC Blended exam prep courses.

Chose from our One day and Two day course options: See <http://www.mosaicprojects.com.au/Training-PMGen%205-STEPS.html>

Planning Planet Scheduling Certifications - Planning Planet have announced the development of a scheduling certification structure. For updates visit www.planningplanet.com

AACE Planning and Scheduling ProfessionalTM (PSPTM) – An advanced credential focused on construction & engineering professionals with 4 to 8 years experience. See: <http://www.aacei.org/educ/cert/PSP/>

Project Manager -v- Project Scheduler:

The differences in personal attributes between a competent project manager and a competent scheduler are discussed in '**Project management vs Project scheduling**' downloadable from: http://www.mosaicprojects.com.au/Resources_Papers_107.html

The papers in this series:

- A Guide to Scheduling Good Practice: http://www.mosaicprojects.com.au/PDF/Good_Scheduling_Practice.pdf
- Attributes of a Scheduler: http://www.mosaicprojects.com.au/PDF/Attributes_of_a_Scheduler.pdf
- Dynamic Scheduling: http://www.mosaicprojects.com.au/PDF/Dynamic_Scheduling.pdf



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- Links, Lags & Ladders: http://www.mosaicprojects.com.au/PDF/Links_Lags_Ladders.pdf
- Schedule Float: http://www.mosaicprojects.com.au/PDF/Schedule_Float.pdf
- Schedule Levels: http://www.mosaicprojects.com.au/PDF/Schedule_Levels.pdf
- Schedule Calculations: http://www.mosaicprojects.com.au/PDF/Schedule_Calculations.pdf

Additional information; see Mosaic's Scheduling Home page at:
<http://www.mosaicprojects.com.au/Planning.html>

