

The Scheduling Maturity Model



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Introduction

How do you measure an organisation's ability in implementing and applying a scheduling process across its projects? How do you know that your organisation's scheduling process is applied in a consistent and appropriate manner? For example, what are the minimum requirements needed to enable a project or programme to claim it has a robust scheduling process? How do you know your potential alliance partner, prime contractor, client or subcontractor has a robust scheduling process and its constituent elements are in place to ensure that either a project or programme can be controlled and delivered within known constraints?

The scheduling maturity model provides a step-by-step means to understand the 'as is' condition and reference it against a 'to be' condition for a number of scheduling process and quality attributes. The model uses a common framework and can be used for the assessment of a single project or programme's schedules, or to benchmark and compare the relative scheduling strengths of various projects across an organisation. It gives assurors and reviewers a consistent method of assessing either a project's or programme's scheduling health. The model can therefore be used as part of a tailored assessment of either a project or programme, regardless of size, complexity or importance.

This document is intended to be used in conjunction with the Earned Value Management APM Guidelines [2] Introduction to Project Planning [3] and the Introduction To Project Control [4].

It should also be noted that this is a Scheduling Maturity Model, not a Planning Maturity Model. Although planning encompasses the scheduling discipline, the ability to define and measure an organisation's planning maturity is more difficult than being able to do the same for scheduling. As a result, this model is limited to scheduling maturity for projects, and where appropriate, programmes as well. A separate planning maturity model will be addressed in a later SIG publication.

Fundamental Concepts

The Scheduling Maturity Model is intended to provide a defined means of establishing and improving the scheduling capability as part of an organisation's project, programme or enterprise control processes. Moreover, it is intended to support project and programme teams and organisations by improving an important part of their overall project controls capability. One element of this controls capability is the scheduling process. Although such a process may differ between organisations, it is likely to follow the same key process elements to generate a schedule. Figure 1 highlights the main stages in creating a schedule. The Scheduling Maturity Model has been developed to ensure that the quality of scheduling output generated by following the scheduling process meets requirements. In addition, the model may also be used when the process itself needs improvement to ensure that the schedule quality improves.

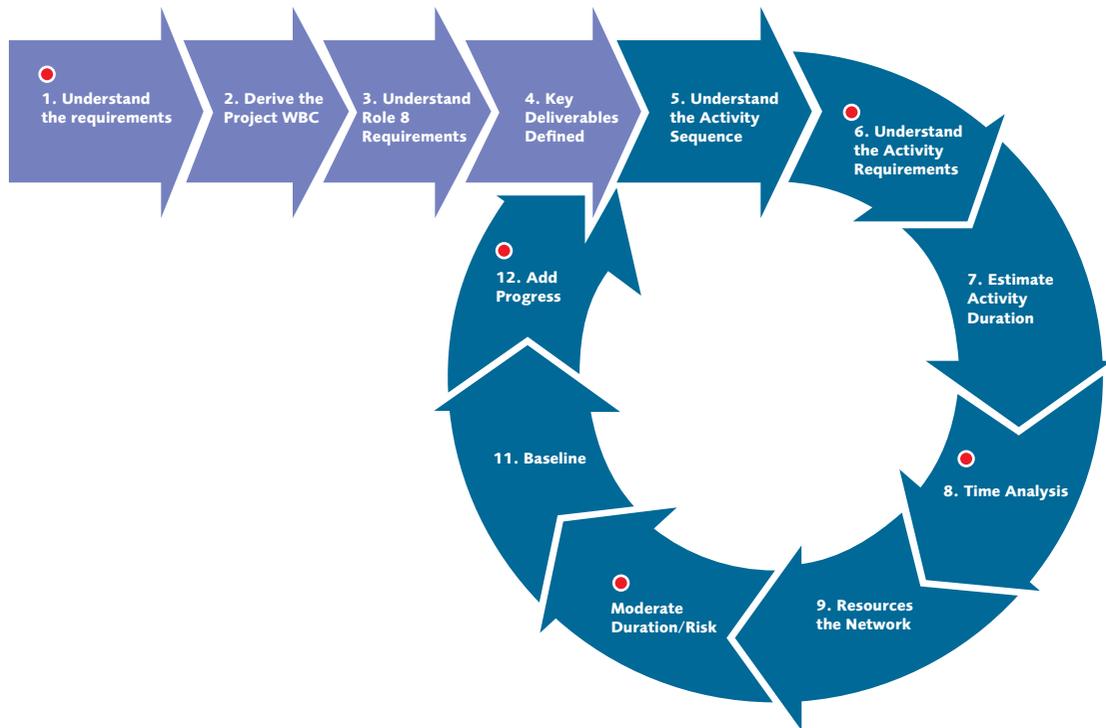


Figure 1 – The Planning and Scheduling process cycle

The project control processes, including scheduling, should be well understood throughout a mature project or organisation, usually through documentation and training. The processes should be continually monitored and improved. As a project or organisation gains in scheduling process maturity, it formalises its processes via policies, standards, and organisational structures. It also entails building an infrastructure and a corporate culture that support the methods, practices, and procedures of the project, programme or organisation so they endure after those who originally defined them have gone.

The maturity model is meant to be scaled and tailored to suit the size, scope, complexity and context of a particular project. Therefore, the assessment should take this into account when allocating a maturity level for a specific scheduling attribute within a particular stage in the project's lifecycle. Moreover, it is expected that some, if not all, maturity levels will change during the project's lifecycle; level 1 or 2 would be expected for most projects that have just started, even in organisations that have significant previous scheduling experience.

How is the Maturity Model used for Assessment?

In the context of this framework, the Scheduling Maturity Model is a comprehensive and systematic review of scheduling maturity. This can be used to aid process improvement by identifying shortfalls against the target standard.

The review is conducted using a maturity grid that outlines maturity levels against each attribute of the scheduling system, within a set of eight themes. The eight themes are colour coded in the spreadsheet used for the assessment. The 28 attributes are grouped as follows: Process & Toolset, Schedule structure & hierarchy, Schedule Integration, Schedule/Resource/Cost Integration, Schedule Risk, Schedule update and Maintenance, Environment and Scheduling Goal. A target maturity level should be established for the project or projects within an organisation at the outset and the maturity at the time of review related to this target. The target will typically be agreed with a customer of the project or within an organisation. It is for individual project teams/organisations to set their target standards. However, customers who require full compliance with a known standard (for example NEC3 and ANSI 748 as detailed in Annex C) are unlikely to be satisfied with maturity below level 3 during the implementation phase of a project.

The assessment process allows the project to clearly discern its strengths and areas in which improvements can be made, and should culminate in planned improvement actions which are then monitored for progress. The frequency of reviews is a decision for the project or organisation.

Throughout this document, the word enterprise has been used to encompass project, programme, portfolio, Business As Usual (BAU) and organisational activities. There are aspects of the model that are seen not to be enterprise-wide. Where a decision has been made to replace the word enterprise, this has been done using one or more of the adjectives used in the list above.

Annex A – Scheduling Maturity Model Questions

ATTRIBUTE MATURITY LEVEL							
	1	2	3	4	5	As Is	To Be
Process and toolset	1. Use of Scheduling Process & compliance to contractual requirements						
	The scheduling process is ad-hoc and not coordinated. There are no documented scheduling guidelines or standards. The schedule complies with most, if not all, applicable contractual requirements for schedules.	The scheduling process is ad-hoc and not fully coordinated. Some local scheduling guidance in place. The schedule complies with all applicable contractual requirements for schedules.	The scheduling process is structured and focused. It utilises a set of standard, documented, and controlled processes for the preparation and publication of schedules. Reviews/audits are periodically conducted to ensure documented processes are being followed and contractual requirements are being met.	The scheduling process is followed by the whole team. It utilises metrics to monitor the health of the scheduling processes and performs scheduled self-assessments, as documented, to ensure processes are being followed.	All projects and contracts within the programme adhere to a consistent documented scheduling process. All project teams follow the same process. Poor process performance is isolated, and corrective action plans are implemented. Root cause analysis is performed and corrective actions are implemented when scheduling process issues are identified. Process improvements are identified and fed into the Project Management Function.		
	2. Scheduling tools are suited to enterprise needs						
	Schedules are generated by hand or PC graphics software.	Master and team schedules are developed manually using one or more databases. Integration between team schedules is managed separately from the scheduling toolset.	Project management software (networking and resource loading capability) is used for non-recurring schedules or other appropriate schedules. Management-recognised standard software tools are used. All schedules are integrated in a 'single-source' database with manual links to other systems. Schedules are manually linked to other systems as part of performance management.	All schedules are integrated by automation into a 'single-source' database. There is automated linkage between the 'single-source' schedule database and other systems containing schedule data. Schedule performance metrics exist in the MIS. Appropriate scheduling tools are utilised based on the size and complexity of programme.	Colour-coded (or other differentiator) schedule metrics with drill-down capability are generated from the scheduling database for the MIS. Presentation graphics are generated from the scheduling database. Major supplier detailed schedule data is transmitted via electronic data interchange (or other automated technology) and is electronically integrated into the programme schedule. Scheduled/network templates are used for standard sequences of activities.		
3. Schedule analysis products are current and used throughout the enterprise							
Schedule update is ad-hoc. Clearly defined ownership of schedule elements is not always appropriate.	Schedules are updated and stashed on a regular published update cycle per project management and contractual requirements. (Estimated/forecast dates are projected for milestones and activities which are past due or with negative float.)	Schedule performance metrics are prepared and reviewed with/by Team Leaders on a regular (or other documented) basis. (Examples include: Current schedule vs. actual milestones, deficient item listings, supplier status and impact of late items.)	The following types of metrics are also reviewed regularly. Examples include: an overall schedule performance summary/variance analysis; network and Critical Path Analysis. The project utilises float as an indicator of schedule health.	Predictive analysis is reported in regular meetings and is utilised in the decision-making process by the project management team.			

ATTRIBUTE MATURITY LEVEL							
	1	2	3	4	5	As Is	To Be
Schedule structure and hierarchy	4. Defined organisation/roles and responsibilities						
	No consideration of an Organisation Breakdown Structure (OBS). Roles and responsibilities are not documented.	Roles are defined but responsibilities are not. No OBS is identified in the schedule.	All activities are assigned to an element of the OBS. A documented correlation exists between the WBS and OBS, utilising the RAM.	Organisational issues are subject to change control. OBS and RAM are maintained within the scheduling tool to reflect the current standard.	The project OBS includes cross-references to other OBS at the enterprise level.		
	5. Capturing project and customer requirements						
	There are no formal methods for capturing customer requirements – e.g. WBS or only an outline WBS or PBS.	Scope is documented, defined and decomposed into meaningful, manageable elements. A recognised WBS is established.	All authorised work elements are defined for the project. A WBS is used in this process and captures the full scope of work.	A systematic process decomposes project requirements and identifies the scope of work necessary to deliver these requirements. The scope of work is under configuration control. The link between customer requirements and WBS elements is clearly defined.	All customer requirements have been decomposed into the WBS and associated work scope. This mapping is transparent and under configuration control. Changes to the technical baseline or requirements are properly managed through a documented, integrated change control process.		
	6. Basis of Estimate						
	Project estimates are produced without Project Team consultation and without documented procedures.	There is a record of estimates but formal estimating techniques and processes have not been applied. Estimating assumptions are not fully documented.	A formal structured estimate has been generated following standard estimating procedures. All estimating assumptions are fully documented.	Estimates are based on previous project norms, historical data, or parametric estimating. All estimating assumptions are fully documented.	The estimate has been reviewed by an independent authority. Upon completion of projects the actual performance data is used to inform future estimates/update project norms. Full ownership and authorisation of the estimate is shared by all relevant stakeholders.		

ATTRIBUTE MATURITY LEVEL								
	1	2	3	4	5	As Is	To Be	
Schedule structure and hierarchy – continued	7. Deliverables defined and documented							
	Project deliverables are not defined and are not referenced back to the objectives/WBS.	The project deliverables are defined, but not integrated with the WBS or schedule.	The project deliverables are clearly defined and documented and related to the WBS.	The deliverables are documented and defined and the outputs clearly visible in the schedule.	The project deliverables are documented, defined, and clearly visible in the schedule. Changes to the deliverables are managed and documented.			
	8. Structure of the schedule							
	There is no consideration of any structure. Activities are randomly placed in the schedule.	There is an attempt to structure the schedule by the WBS. Not all activities are assigned to a WBS element.	All activities are assigned to a WBS element.	The schedule is comprehensively structured by the WBS. Cross-WBS linkages are defined in the schedule logic.	All tasks and milestones are assigned to their relevant WBS. The schedule is comprehensively structured by the WBS and its different levels. Cross-project linkages are defined in the schedule logic.			
	9. Project scheduling and development of schedules							
Some schedule constraints, calendars and major deliverables are identified.	All constraints, calendars and major deliverables are identified.	Durations and resource requirements are based upon demonstrated historical performance and are utilised in schedule development. A project planning checklist is used at the front end of the project to make sure all areas are being covered.	Schedule structure demonstrates improving project maturity and increasing identification of project risk. The schedule is developed top-down based on major events. Project milestones and deliverables are validated bottom-up, demonstrating vertical traceability. Suppliers provide detailed schedule information on development items. Schedule risks are identified. Issues of resource constraints can be identified and timely corrective action proposed.	Schedule modelling techniques are used (e.g., networking or manufacturing capacity analysis). All schedule optimisation techniques are documented along with a rationale and risk assessment and are approved by management. Schedule risk items are highlighted.				

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ISBN 978-1-903494-47-9



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