Managing Projects with Microsoft Project 2010

A manual by Advisicon®
Helping You Build a Project Management Culture

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Identification and Notices

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About Advisicon

Advisicon is a professional project and portfolio management consulting, training and custom application development company. Advisicon helps our clients leverage the best practices of project management methods and technologies to manage projects more effectively.

Advisicon is a Registered Education Provider (REP) of the Project Management Institute (PMI), giving clients the confidence that they have chosen an organization that is well qualified to provide the instruction they need as well as the convenience of receiving Professional Development Units (PDUs).

Advisicon is a Microsoft® Gold Certified Partner with Enterprise Project Management (EPM), Information Worker, and multiple other advanced certifications. Advisicon helps organizations use Microsoft Project, Microsoft Office Project Server and SharePoint Services to manage their projects more effectively through optimization, training in best practices, and process and template development. Advisicon's consultants deliver deep expertise to our clients to help them use MS Project more effectively to deliver sustained results.

Our People

Advisicon's team of professionals includes Project Management Institute certified Project Management Professionals (PMPs), Microsoft Certified Professionals with specializations in Enterprise Project Management, Networking and Infrastructure Solutions, and Microsoft MVPs.

Our Philosophy

Advisicon is about delivering: Optimization, Knowledge Transfer and Sustained Results.

Our Services

- Microsoft Project and Project Server Deployments, Consulting and Training
- SharePoint Deployment, Custom WebPart Development, and Training
- Microsoft Access & SharePoint Application Development, Consulting and Training (see back of book for contact information or check our website, www.Advisicon.com)

- Project Management Office Formation and Development
- Project and Portfolio Management Consulting and Training
- Project Management Maturity Assessments
- On-Site Project Management Support
- Custom Application and Database Development

Our Team

- Project Management Institute-certified PMPs
- Microsoft® Certified Professionals (specializations in Enterprise Project Management, Networking and Infrastructure Solutions)

Advisicon serves clients in every type of industry including business, government, non-profit. Our services span international companies in North, Central and South America as well as Europe and Asia Pacific.

Visit Advisicon's website to read case studies of how Advisicon has helped clients, or to learn more about our services and products, contact Advisicon at 1-866-36-ADVIS or visit us at www.Advisicon.com.

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Tim Runcie, MCTS, MCP, PMP, MVP, Advisicon President

Microsoft Partner
Gold Project and Portfolio Management
Silver Portals and Collaboration
Silver Midmarket Solution Provider

PMI Project Management Institute R.E.P.

Microsoft Most Valuable Professional

Microsoft Office Project
Enterprise Project Management Solution

Tim Runcie, the President of Advisicon, has over 20 years of experience in Information Systems and 12 years in Construction Management. Tim has been recognized by Microsoft as an MVP (Most Valuable Professional) for his outstanding excellence in Office and for his support to technical communities worldwide. He was first recognized as an Access MVP and has continued to gain recognition as a Project Portfolio Manager (PPM) in Enterprise Project, Program and Portfolio Management MVP for his expertise in MS Project, Project Server & SharePoint.

Tim has been assisting Project Management Offices and Organizations (PMO's) in leveraging technology like Access, Project, Project Server & SharePoint to meet their business Intelligence and reporting needs. His experience covers all sectors of customer industries such as Government, Non-Profit, Private Business, Manufacturing, Construction, Banking, Healthcare and the Information Services or Information Technology industries.

He has focused in consulting, mentoring and training organizations to successfully complete their projects using scarce resources, fixed budgets and interconnected schedules, while leveraging technologies to automate and create powerful visual reports. Tim combines industry best practices, a passion for knowledge transfer, and tools development to optimize Project and Project Portfolio Management processes and to successfully integrate Project Management best practices into organizations' culture.

Tim loves teaching. When not leading or mentoring organizations, he is teaching classes centered on the disciplines and technologies of Project Management. To every project he brings a personal passion for education and a commitment to providing Advisicon's customers with a full set of skills and tools to achieve optimum success.

A. Lynn Jesus, MCTS, Project+, PMP

Lynn is an Education Advisor with Advisicon, Inc. She brings 15+ years of experience in managing projects and sharpened skills that are transferable to a multitude of environments. She also holds the prestigious Project Management Institute (PMI) Project Management Professional (PMP) credential, as well as an MCTS (Microsoft Certified Technology Specialist) in Project, MOS (Microsoft Office Specialist) in SharePoint 2010, and the Project+ (CompTIA) certifications.

Lynn has developed curriculum and taught project management and technology best practices, and PMI certification exam prep for the CAPM (Certified Associate of Project Management) and PMP exams. She has also contributed to industry white papers, blogs, vlogs and book content focused on the Microsoft Enterprise Project Management (EPM) solution.

Lynn is an active presenter and contributor to communities of practice. She has presented to several professional groups such as PMI, SharePoint User Groups, Project Management Groups, as well as SharePoint Saturday Bend. A true believer in knowledge transfer, Lynn strives to bring her zeal for these technologies and applications to audiences. She loves teaching and is passionate in blending her extensive experience and knowledge in client consulting and training engagements to customers and students, so they can continue to build upon their own skill set.

Cindy M. Lewis, MCTS, MCITP, MCT, PMP, PMI-SP

Cindy is a Senior Project Advisor at Advisicon, Inc. She brings nearly 20 years of experience in scheduling, training and managing large projects. As a professional project manager, Cindy has focused her career on Information Technology projects specializing in company-wide system implementations spanning industries such as architecture, financial, manufacturing, medical, education and high tech. Cindy has in-depth expertise in lifecycle management, organizational project/portfolio process development and management, and customized curriculum development and execution.

Cindy has been a sought-after consultant called on to help numerous companies both locally and across North America to deploy, assist and, if needed, rescue failed Project Server implementations in versions 2002, 2003, and 2007. In Project Server 2010 Cindy has captured complex business requirements and delivered a best in case solution recommending features that derive value for the business and provided consultative training to apply these features immediately. She has deployed Project Server 2010, deployed Proof-of-Concept instances and has directed Project Server 2007 to Project Server 2010 upgrades. Her vast experience includes working with both on-site and cloud based (hosted) solutions.

Her passion is training and leading large groups via both live and virtual classrooms. Courses are delivered several times a month onsite at customer training facilities.

Advisicon is pleased to announce that Cindy received the Most Valuable Professional (MVP) award in Project by Microsoft in 2012. With an estimate of less than 60 people receiving this designation for Project out of the thousands of MVPs awarded worldwide, this is a great testament to her dedication to the scheduling community. She is the second person at Advisicon to receive this award following Tim Runcie. If you haven't seen Cindy, watch for her at the next Microsoft or PMI conference or event. Some of her past duties at these events including giving short presentations, running hands-on labs, working Project kiosks and booths, demoing software, and working at Ask the Experts' events.

Comments & Feedback

We are interested in your feedback about this publication. It is our goal to continually improve our books and resources and to enhance your learning experience. Please email us at info@Advisicon.com, and let us know your thoughts.

We look forward to hearing from you. Happy learning!

Contents

How To Use This Book

Conventions Used in this Book

Legend of Icons

A number of icons are used in this book to highlight important information.

The PMBOK icon and call-out box refers you to where you can find a concept or term in the Project Management Institute's Project Management Body of Knowledge – The PMBOK.

The Note Icon and call-out box indicates a key fact or insight to help participants better understand helpful background information, quirks, explanations for the way things work, answers to Frequently Asked Questions (FAQs), and helpful things to remember.

The Tip, Trick and Shortcut icon and call-out box presents quick ways to do things faster and impress colleagues.

The Warning Icon and call-out box will draw your attention to important risks, pitfalls, potential isues, and alternate concepts that may assist you with managing your project processes.

The Meaning of the Fonts

This book uses a few conventions to display meaning within the text.

Bold text indicates the title of a button, menu item, or file name, that should be clicked on or selected to complete a step. Bold text also indicates a key word or phrase worthy of consideration.

Text that is set in a monospace font indicates text that needs to be typed in (like a URL, or code).

Navigating this Book

This book has been organzed in a linear, progressive manner. Each chapter builds upon the concepts and skills learned in the previous chapters. Every chapter begins with an overview to give you some insight into the topics that will be covered and ends with highlights of the key points to remember from the chapter.

Chapter 1

Leveraging Technology for Project Management

Overview

Upon completion of this chapter, the participant will be able to:

- Discuss project management goals and required competencies.
- List common project risk factors.
- Explain how the process groups and knowledge areas are used in the Project Management Body of Knowledge (PMBOK).
- Discuss the benefits of Microsoft Project 2010 to support project management.
- Differentiate between local and shared resource pools.
- Describe the purpose of the Practice Standard for Scheduling.

Project Management as a Discipline

Project management is the discipline of blending time-tested best practices, defined processes, soft skills, and the use of tools and templates, then applying these to initiatives resulting in proactive efficiency. Stakeholder satisfaction is better realized when utilizing a consistent and methodical approach to the management of projects. Also, this systematic approach paves the way for easier measurement and progress tracking of a project.

One of the most used tools is technology to assist project managers in developing schedules capturing scope, progress and project reporting. One of the most popular technology tools is Microsoft Project (hereafter known as Project).

This course will focus on use of the desktop version of Project.

The Project Management Goal

It is often said that tools do not manage projects – people manage projects. In that light, it is important to remember that technology is only a tool.

The use of Project is not the “Silver Bullet” answer to:

- Resolving project management deficiencies
- Improper change control processes
- Risk analysis and change impact assessment

Project is a great tool for:

- Tracking of task and schedule progress
- Forecasting and value management
- Resource management (allocation details)

The Goal

The ability to satisfy the project requirements is the ultimate goal of project management. Satisfy the requirements and undoubtedly you will satisfy the customer. This does not mean that the deliverables will not change, but through managing customer expectations and clear communication revised requirements can be met.

A properly managed project allows a diverse team of customers, sponsors, experts and stakeholders to:

- Agree on the deliverables
- Work efficiently to deliver the project on time and on budget
- Agree at the end that all requirements and specifications have been met

Six Core Competencies

To achieve these goals a project team needs more than their technical skills. High performance project teams excel at these core competencies:

- Planning: Build schedules with sufficient detail to enable management of activities and resources.
- Milestone management: Use milestones to clarify deliverables and accountability.
- Scope control: Use systems to reduce rework and manage scope controls.
- Risk management: Continuously assess risks so that they are prioritized, mitigated, and communicated.
- Issues management: Capture relevant issues so that they are properly prioritized and efficiently managed.
- Communications: Keep sponsors, team members, customers, crossproject contacts, management, and other stakeholders informed and engaged.

Projects More Likely to Fail

Many times projects have significant hurdles to overcome. As a project manager or a member of a project team, you can look for the tell-tale warning signs of a project process that is not working.

Major Risk Factors Leading to Project Failure

- The user's requirements are not accurately understood, clarified, or reconciled. The project delivers a product the customer does not like or does not use.
- Failure to control scope creep and added feature enhancements. Estimates show that over half of the effort expended on many projects is outside the original project scope and plan. Much of the new work is poorly documented and un-budgeted.
- Technical/feature specifications change too often along the way. The project wastes time and resources doing rework.
- Loss of management support. When corporate priorities shift projects may become casualties.
- Team is not aligned on the same outcomes. The team fails to clearly understand what outcomes the customer is expecting and, therefore, internal confusion jeopardizes project success.
- Lukewarm support from key people. Stakeholders say "yes," but resources are not allocated and work is not properly prioritized.
- Failure to have a plan with adequate details and controls. Too much time is lost coordinating details which often results in inadequate or late deliverables.
- Failure to agree on how decisions are made. Decisions made by the wrong people or at the wrong time result in suboptimization, staff frustration, and rework.

- Inadequate coordination between teams and between organizational/ departmental silos. Results in duplications, incompatibilities and rework.
- Lack of an adequate adoption and learning plan. The best product in the world fails when people are not motivated to use it, are not organizationally structured to use it, or lack the skills and know-how to use it effectively.

It is up to the project team, and ultimately the project manager, to watch for these common hindrances to projects and put efforts in place to counteract ill effects that can damage project success.

Project Lifecycle Management

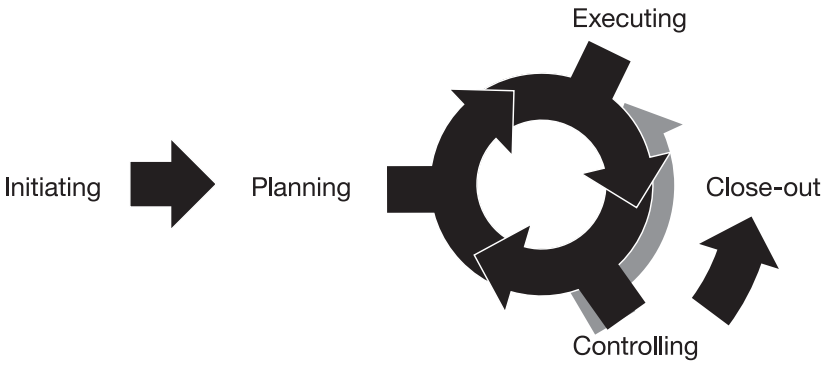

Figure 1-1 Project Lifecycle Management

Complex project management processes require tools to manage them. People tend to use what they have available, are already familiar with, and already use. This is why Microsoft Office Excel is often used in smaller project management initiatives. For many projects, Excel is sufficient.

However, it does not take very much complexity – higher number of tasks, multiple interrelated schedules, resources, requirements, deliverables, and departments – to exceed Excel's project management capabilities. Advanced software applications have been developed to support and facilitate many levels and styles of project management – from simple, high-level schedules to complex, integrated enterprise solutions.

Project management processes can become very multifaceted. One of the risks of complex processes is that they tend to be ignored in practice, resulting in inconsistent results, idiosyncratic management, and frustration.

Strategic project management methods and consistent project management processes need tools designed specifically to support them to be truly efficient and effective. The leading application on the market specifically designed to support project management is Project.

Project is a powerful relational database program that can be configured for use on a single client PC in Project Standard or Project Professional. But its capabilities to facilitate and automate enterprise-wide project management processes within a networked system are limited. For organizations that are seeking an integrated, enterprise-wide project and

portfolio management solution, Microsoft has developed Project Professional to integrate with Project Server.

As defined by the *A Guide to the Project Management Body of Knowledge (PMBOK® Guide) – Fourth Edition*, a project is a temporary endeavor undertaken to create a unique product, service, or result. The temporary nature of projects indicates a definite beginning and end. The end is reached when the project's objectives have been achieved.

Project management, then, is the application of knowledge, skills, tools and techniques to project activities to meet the project requirements.

The **PMBOK** breaks projects into 5 Process Groups and 9 Knowledge Areas for management of a project. The 5 Process Groups are:

- Initiating
- Planning
- Executing
- Monitoring & Controlling
- Closing

The relationship of the 5 Process Groups are outlined in Figure 1-1.

The 9 Knowledge Areas span the 5 Process Groups to provide the basis for managing a project. The Knowledge Areas are:

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resource Management
- Project Communications Management
- Project Risk Management
- Project Procurement Management

Each intersection of Group and Knowledge Area may have deliverables. Each deliverable is broken out into the following format:

Figure 1-2 Project Inputs, Tools, and Outputs

The inputs are applied using tools and techniques to get the resulting outputs.

Leveraging Technology for Project Management

Why use Project?

Projects have become a strategic vehicle for leading change. Utilizing technology to support higher success rates of projects is integral for supporting this change and driving continuous improvement.

Some examples of organizational projects are:

- New product and service development projects
- Process improvement projects
- Policy and organizational development projects
- Technology development and implementation projects
- Focused activities to deliver specific outcomes for clients

Organizations are pursuing more and more different kinds of projects every day.

For some organizations, projects are a small, but an important part of their business. Many organizations are projectizing their strategic work – so they can more effectively focus on key initiatives.

For others, projects are their business. From architects, builders, engineers and construction companies to marketing teams, IT organizations, and software developers… projects define their work.

The demand for effective, consistent project management has grown rapidly over the last decade. Project management has rapidly become a core area of management knowledge and practice. The role of a project manager has become very common in organizations.

The question project management focuses on answering is: what are the processes that lead to successful projects?

Different Project Lifecycle Approaches

The project management discipline has developed into a core area of organizational management. Different industries have developed project management methodologies that address their specific workflows and issues. Architects, construction companies and property developers have developed a set of project lifecycles that reflect certain standard processes from land planning and acquisition, to permitting and design requirements. Other industries, such as software development, have developed different methodology and processes to accommodate their environment.

The rapid growth of the project management field has spawned a number of professional associations. The Project Management Institute (**PMI**) is the largest global project management professional association in the world today and it is continuing to grow rapidly. The most widely used standard for project management has been developed by the **PMI**.

PMI

PMI has developed a very extensive library of project management standards, references and tools. **PMI** has collected the most comprehensive reference on project management standards in a book called *The Project Management Body of Knowledge* – affectionately called "The **PMBOK**." The **PMBOK** defines a certain standard for project management practices, which many industries follow.

Project has been developed to support a range of **PMBOK**-aligned project management approaches. It can be configured to support other approaches, such as Scrum and Agile, but organizations employing these methodologies need to adjust their use and expectations of Project as a scheduling and management vehicle.

Technical Lifecycles (Agile to Scrum)

There are other approaches to project management that have been developed by and for project managers in different fields and industries. Two approaches used fairly widely in the technology sector are called Scrum and Agile.

The software development and technology industries have developed approaches to project management that reflect the need of short design-build iterations to facilitate integrating emerging requirements into new product development processes. These tend to focus on shorter iterations and progressive requirements definition.

It might be said that where the PMBOK methodology focuses on thorough planning before project execution, Scrum and Agile focus on minimizing the time between project initiation and execution, and repeated cycles of design, build, test, redesign, rebuild, and test.

Industry-Specific Lifecycles

Some industries and fields that have developed their own project management methodologies and lifecycles include:

- Construction
- Architecture
- Information Technology
- Software development
- Property development

Project and Project Server are able to be configured and utilized to support many different project management processes, and is especially applicable to projects with longer life cycles, from one month up to the year 2049.

Resource Management

Working with and managing resources is crucial to effective project management because resources accomplish the actual work to create deliverables. Every schedule you create offers a wide range of resource features to support your needs; however, each resource is assumed to be schedule-specific, which may not be true for your organization.

Project desktop offers you the option to create a locally shared resource pool; while not as powerful as what is available in Project Server, it does offer some centralized management of resources.

For an introduction to shared resource pools, see Overview of a Shared Resource Pool, on page 304.

Demand & Capacity Planning

By creating time-phased schedules of work, tasks, deliverables and activities, you are in a position to do forecasting of incoming or existing work.

By adding resources in Project, whether from an external resource pool or from an internal resource sheet, you add the capability to do capacity planning for cost, work and materials.

This is an extremely important feature that executives, stakeholders and project/program managers are looking for. The ability to compare planned work, cost and effort to existing capacity will rapidly help organizations realize the Return on Investment (ROI) from using a scheduling tool.

This also allows you to start leveraging metrics to produce reports, visuals of the workload or anticipated workload.

Microsoft's Project Management Solution

Microsoft offers a variety of software solutions that can be used to map with organizational maturity levels and desired levels of collaboration. The following graphic illustrates recommended mappings. This book focuses on the Project Professional and Project Standard versions of Microsoft Project which provide features for both basic and advanced project management.

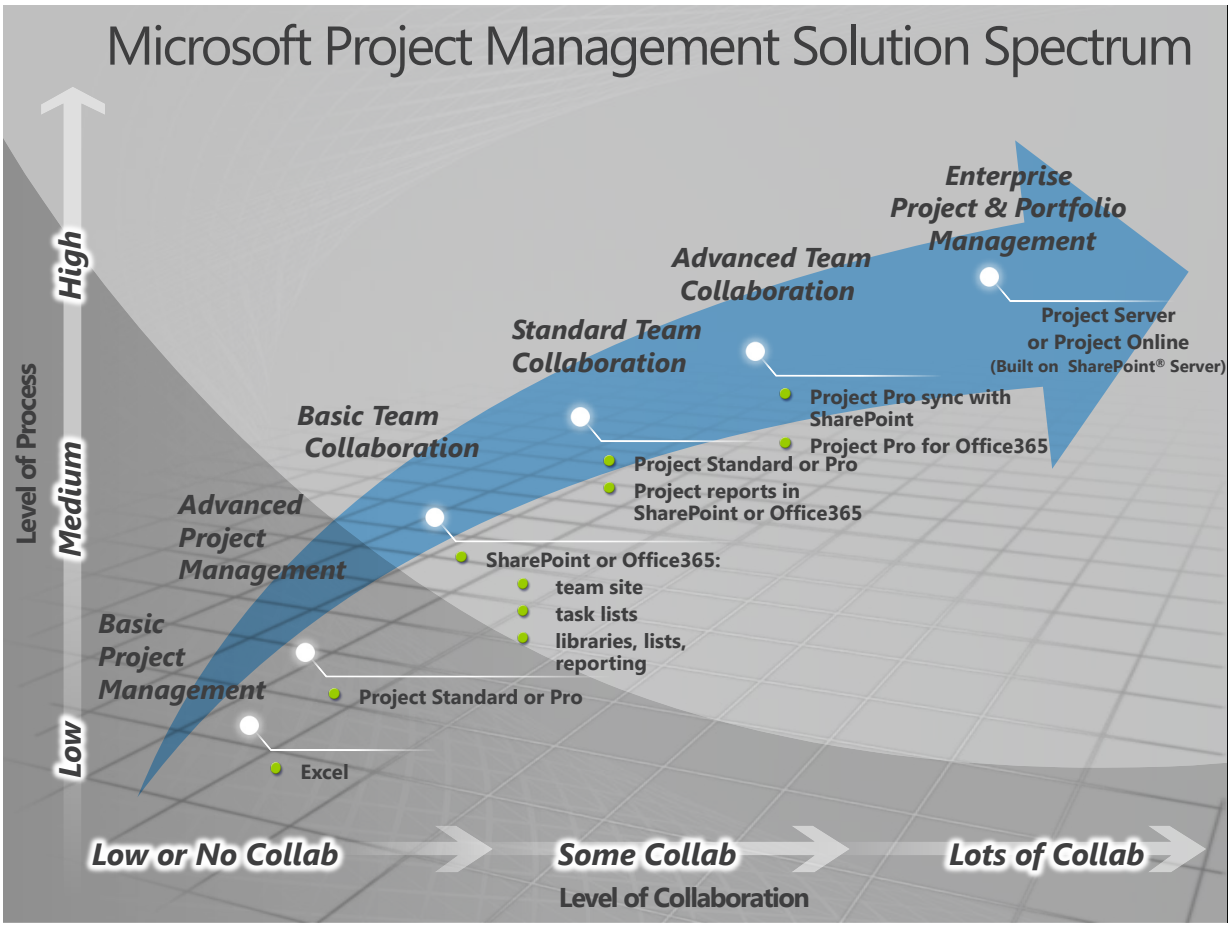

Figure 1-3 The Microsoft Project Management Solution Spectrum

Project Professional vs Project Standard

In Project 2010, there are two editions for desktop users. Project Standard offers all the typical schedule features needed for most users and includes features that have been available in previous releases. This edition is suited for the individual scheduler that will not be using Project Server.

Project Professional has two purposes. First, it contains advanced scheduling features for the desktop user that are not available in Project Standard. Second, it is the only desktop version that will connect to Project Server. Since this book is written for both editions, we will indicate which features are only available in Project Professional.

Project Server

Some organizations will not only use the desktop version of MS Project, but they will centralize those schedules and resource pools in a web-based, SQLbased environment. This is called Project Server and it provides a significant stabilization of project and resource information, while simultaneously enabling web based viewing, tracking, progressing and reporting (in SharePoint).

For further information on this, take our Managing Projects with Microsoft Project course. Public and private classes are available.

http://managing-projects-with-microsoft-project-2010.eventbrite.com/

Tracking and Managing Planned vs Actual

Project gives project managers and teams the ability to create project schedules, and save their original plans reflected as saved baselines. Once the schedule has been approved (in full or for a particular project phase), it is recommended that the project manager baseline their schedule just prior to work beginning. This will create a historical record of the original approved schedule plan.

These baselines give project managers and organizations the ability to compare and analyze actual project performance. Items such as resource work hours, task progress and realized costs can be analyzed against the latest baseline to measure variances and forecast organizational needs to ensure the project remains on track, and what measures, if any, must take place to align actual progress against expectations. This data can help guide lessons-learned sessions, process improvement projects, team reviews, and even performance bonuses.

Following the guidelines presented in this book project managers will be able to perform resource management including anticipating resource demands and accurately planning and tracking a schedule.

PMI's Practice Standard for Scheduling

Due to requests by the project management community, PMI created extensions to its most popular book, the PMBOK. One of these extensions is the Practice Standard for Scheduling. This particular extension was created out of the need to provide guidelines on something that most project managers do every day – schedule. While not specific to any scheduling tool, you will be happy to know that Project does conform as a schedule model according to their Conformance Assessment Process, which means Project has all the required software components needed to function as a valid schedule tool.

The purpose of this extension is to provide best practices for the creation of a schedule model. It is not to recommend particular software, but instead provides components that should be considered as required in your selected scheduling software. A good schedule must have both a strong scheduling framework and a baseline schedule. Each of these two areas are discussed in detail in the standard. A large portion of the standard contains a components list that you can use to help communicate with others about elements in a schedule. In terms of Project, many of these components are called fields.

Some of the important definitions made in the standard:

- Scheduling is all about the "roadmap" of how you plan to deliver the project.
- **Schedule Method** – how you want your information calculated to generate a schedule (e.g., critical path method).
- **Scheduling Tool** – software that is capable of applying your schedule method.
- **Schedule Model** – a scheduling tool that implements a scheduling method generates a schedule model.
    - In our instance, Project uses the information you provide against the critical path method of scheduling and generates a schedule model. The schedule model is a dynamic representation of how project activities will be executed by the resources.
- **Project Schedule** – this is one output of the schedule model which could include a bar chart.

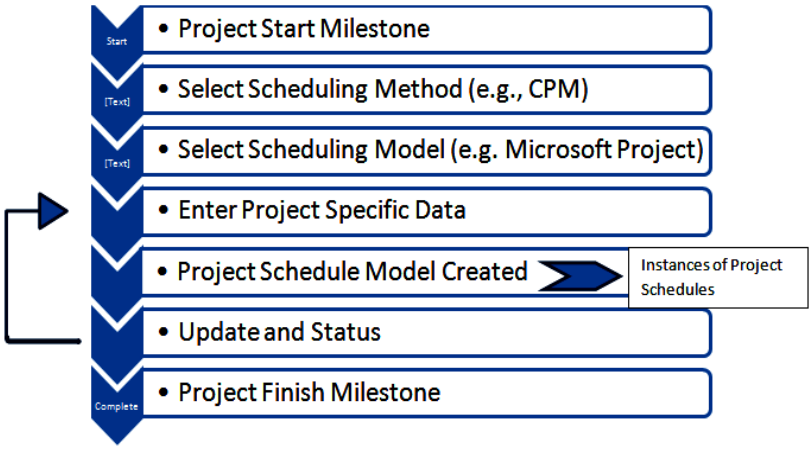

Figure 1-4 The Schedule Development Process

Some differences between the Practice Standard for Scheduling and this book:

- Our book discusses estimating tasks with duration or work values before adding resources, while the Practice Standard adds resources before estimating tasks. You can do these items in either order in Project and still have a valid schedule.
- Our book discusses task relationships/linking before assigning resources while the Practice Standard does the reverse. You can do these items in either order in Project and still have a valid schedule.
- Project uses the term Status Date, while the Practice Standard uses Data Date.
- The Practice Standard states that a valid schedule model must include both a start and finish milestone which all activities must connect to. We consider this a personal choice and schedules can still be valid even if these two milestones are not present.
- The Practice Standard recommends limiting the use of lags and negative lags (leads) and instead adding extra tasks or modifying relationships. In our experience, it is your personal preference to use lags/leads or not.

The Practice Standard for Scheduling is available at no charge online to PMI members or available in the PMI bookstore for non-members.

The Practice Standard for Scheduling was updated to the Second Edition in 2011.

Key Points to Remember

- Project management can become more disciplined by applying a technology such as Project.
- Your plan should be to satisfy your goals and the goals of your customer.
- Use technology to support high rates of project success.
- Choose the lifecycle approach that fits your industry or type of project.
- Managing resources is critical for the success of your project.
- Follow the Practice Standard for Scheduling where appropriate.

Appendix A

Feature Changes from Project 2007

Add-Ins, Sample Macros, and the Project Guide

Add-ins, sample macros, and the project guide have been modified or removed from Project 2010 as indicated below.

The following add-ins are now built-in features in Project 2010:

- Compare Project Versions – Compare Projects is on the **Project** tab.
- Adjust Dates – use the **Move Project** feature on the **Project** tab.

The following add-ins have been removed:

- Pert Analysis – use Excel to apply the formula to a selection of numbers instead, copy/paste or import results into Project.
- Copy picture – no longer automatically creates an Office document and cannot export to the JPG format. Use **File, Save & Send** options instead.
- Format_Duration – select the duration format before creating a list of tasks instead (**File, Options, Schedule** tab).
- ResMgmt_TaskEntry – use the **Details** check box on the **View** tab instead.
- Rollup_Formatting – available in the **Task Information** dialog box.
- Toggle_Read_only – duplicate feature from Windows.
- Update_File – if using Project Server, check in/check out and read only features help indicate if schedule is current or potentially being updated.

Save as Excel Pivot Table

Save as Excel Pivot Table is replaced by **Visual Reports** on the **Project** tab in Project 2010, Professional and Standard.

The ability to save directly into a pivot table has been removed.

The **File, Save As** menu previously included the following:

- Save as XLS
- Save as XLS Pivot Table

The **File**, **Save As** menu now includes the following:

- Save as XLS
- Save as XLSX
- Save as XLSB

Appendix B

Glossary

A

Accrual method Costs for work and fixed costs against tasks in Microsoft Project can vary how they are accrued against time. For example, $2,000 for a 10 day task could be accrued at:

- Start – $2,000 on day one.
- End – $2,000 on day ten.
- Prorated – $200 each day.

Actual Bars Bars on a Gantt chart drawn from the actual start to complete through for tasks in progress and to actual finish for those that have been completed.

Actual Cost (Assignment) Costs incurred for work already performed by a resource on a task. This value can be calculated by Microsoft Project or entered by the user.

Actual Cost (Resource) For all assigned tasks, this value shows the sum of costs incurred for the work already performed by a resource.

Actual Cost (Task) Costs for work already performed by all resources on a task, plus any other actual costs for the task. This value can be calculated by Microsoft Project or entered by the user.

Actual Duration Until the project is progressed, this value is 0. If an Actual Start and Actual Finish are present for the task, this value will be the duration between them. If no actual finish is present, it is a value entered by the user, or calculated around the task's percent complete.

Actual Start The date (and optionally time) that the task or assignment commenced. Can be entered (over the default of NA) or calculated from an entered actual finish or an entered percent complete value.

Actual Finish The date (and optionally time) that the task or assignment was completed. Can be entered (over the default of NA) or calculated from an entered percent complete value of 100%.

Actual Work (Assignment) Until the project is tracked with actuals, this value is 0. When actual work information for tasks or assignments are added, this value will increase. It will also increase relative to the task's percent complete value if the updating task status updates resource status option is selected.

Actual Work (Resource) The amount of work that has already been done against the assignments for a resource. It is a calculated value.

Actual Work (Task) The amount of work that has already been done against a task. This value can be calculated by Microsoft Project or entered by the user.

ACWP Within earned value analysis, the Actual Cost of Work Performed. This field shows actual costs incurred for work and any fixed costs for tasks, up to the project status date or its current date. When compared to BCWP, cost variance values can be determined.

Aggregation The summing up of resource demands over time. If a resource is scheduled to work on two tasks simultaneously, aggregation will add up the units assigned to the tasks per time unit and display the total units assigned – in this case two (or 200%). If this number exceeds the resource's max units, then a resource conflict may ensue.

ALAP Tasks will be scheduled to finish on their late finish date rather than their early finish date (as with ASAP). This can be set on a task-by-task basis and it is the default setting when projects are scheduled from a finish date (established within the Project Information dialog box).

Analysis Toolbar Provides shortcuts to additional analysis functions and modules.

ASAP By default, tasks are scheduled to commence as soon as they possibly can. This is either on the project start date or as soon as their predecessors have been completed. This can be set on a task-by-task basis and it is the default setting when projects are scheduled from a start date (established within the Project Information dialog box).

Assign Resources Dialog A dialog box to quickly create assignments. Invoked by the Assign Resources button. Only shows assigned units values and not assigned work. Can be used for assignment drag and drop. For more sophisticated assignments, use the task entry view.

Assigned Units	The rate at which the resource will perform an assignment. Usually at a flat rate (100% being the default), units can be varied with a contoured assignment. Units assigned should not exceed the max units of resource availability. Assigned units is a variable within the scheduling formula.
Assigned Work	Work (and hence time) assigned to calculate the duration of an assignment. Part of the scheduling formula, it is calculated as the total work for the assignment less any overtime work. If only one resource is assigned to a task, the assigned work and the total work are the same.
Assignment Delay	To make an assignment commence later than the scheduled start of a task (or any other assignments against that task), an assignment delay can be manually applied. Assignment delays can not be cleared by resource leveling.
Assignment Finish	The date (and time) at which assigned work will be completed by.
Assignment Start	The date (and time) at which an assignment can commence. Calculated as the task's (that the assignment is against) scheduled start plus any assignment delay or leveling delay values.
Assignment Drag and Drop	A method to quickly create assignments by dragging a resource from the assign resources dialog to a task on a row of a table by using the Assign Resource cursor. Multiple assignments will use the Assign Multiple Resources cursor.
Assignment Replacement	The process where an assignment for one resource is swapped with another resource. When this is accomplished, check that the assigned work and assigned units values are appropriate to the new assignment.
Assignments	An assignment is the relationship between a task and a resource to perform the task. This assignment creates measurable work – one of the three project resources.

AutoFilter AutoFilters are a quick and easy way to select relevant information within one of Microsoft Project's tables. They are turned on and turned off with AutoFilter button on the formatting toolbar. Available to each field within the table, they provide selections based upon the field's values as depicted in the table. Global Filters can be created by saving AutoFilter criteria.

Autolink If tasks are cut or copied, their links may be re-established when pasted if the Autolink option is selected. This also affects when tasks are dragged and dropped or inserted within a sequence of already-linked tasks. This check box can be selected or cleared within the Schedule tab of the Options dialog box (Tools > Options).

Automatic Leveling The mechanism by which a project's resource assignments undergo leveling every time a change is made to the tasks/resources/assignments or manually invoked by using the Level Now button within the Resource Leveling dialog box.

Automatic Scheduling The mechanism by which a project's schedule (calculated with critical path analysis) is recalculated every time a change is made. The check box allows automatic scheduling to be selected or cleared within the Calculation tab of the Options dialog box. Manual scheduling can be activated by pressing the F9 key.

Automatic Updating Options (within the Update Project dialog box) to update work as complete through or reschedule uncompleted work to start based around the project's current date or the project's status date.

Availability Profile Dates when a resource is available to a project at a specific unit of availability. For example: a technical specialist may only be available from March 1 through March 31 at 50% of their available time, or three technicians are available in May, two from July to August and four from the beginning of September. Established within the resource information dialog.

B

BAC Within earned value analysis, the budget at completion value for a task is equivalent to its baseline cost.

Backward Pass A calculation within critical path analysis that determines the late start and late finish dates for each task in the project, along with slack (float) values.

Bar (Task) A patterned bar on a Gantt chart representing the duration and schedule of a task.

Bar Styles A way to format a Gantt chart's bars to emphasize attributes including; critical tasks, milestones, summary tasks, and slack. Text can also be added to the bars. One set of styles is associated with each chart-type view. The view's parameters (including bar styles) are saved with the current project document. Set by the Format > Bar Styles command or fast-formatted using the Gantt Chart Wizard.

Base Calendar A calendar that specifies shift patterns of working time and nonworking time for a project or set of resources. A base calendar differs from a resource calendar, which specifies working and nonworking time for an individual resource.

Baseline A copy of project information prior to updating a project with progress. When a baseline is created, current schedule values are copied into their relative baseline ones:

- Tasks (start and finish dates, duration, work, cost, splits).
- Resources (work, cost).
- Assignments (start and finish dates, work, cost).
- Timephased work and cost for tasks, resources and assignments.

This provides a clear comparison about the status of the project; if it is meeting its baseline or not. Created with the command: Tools > Tracking > Save Baseline. Interim baselines can also be created to assist in what-if? scenarios.

Baseline Bars Bars on a Gantt chart depicting the baseline start and finish dates for tasks.

Baseline Cost (Task) At the point of baseline creation, the current cost for the task (work related costs + fixed costs).

Baseline Duration (Task) The task's current duration, at the point of baseline creation.

Baseline Start (Task) The scheduled start of tasks at the point of baseline creation.

Baseline Finish (Task) The scheduled finish of tasks at the point of baseline creation.

Baseline Work (Resource) At the point of baseline creation, the total work against all assignments for a specific resource.

Baseline Work (Task) At the point of baseline creation, the current work for the task.

C

Calculated Field A custom field in which the contents display values relative to a formula or equation. These formulae can be copied in from other project files or from GLOBAL.MPT. Calculated fields can be used to:

- Show cost/interim baseline cost performance.
- Compare dates to show slippage values.
- Display graphical indicators instead of numeric values.

Enterprise fields can also contain calculated values.

Calendar A definition of working time and non working time (in shift patterns) that can be applied to individual resources working on the project, or to the project and the tasks within it. The default calendar is called a base calendar. Calendars are edited or created within the Change Working Time dialog box (Tools > Change Working Time). The Organizer allows this component to be shared between projects.

Calendar View Project tasks are displayed in a workplanner format, with task bars spanning the days or weeks on which the tasks are scheduled. Tasks can also be created and edited here with care.

Cause-And-Effect Diagram A brainstorming technique where project risks are analyzed by the project team. Each risk is considered, along with the actions or outcomes that would cause the risk to manifest.

Can Level Applying to resources, a switch (Yes/No) to allow the chosen resource to be a part of the leveling process.

Cell An intersection of a row and a column within a table, a cell contains a field about a specific object (task, resource or assignment).

Cell Drag and Drop A mechanism to move (dependant upon its check box being selected or cleared within the Edit tab of the Options dialog box) either:

- A cell's contents to a different cell.
- Or an entire object task/resource to a different row of a table, having first selected a row heading.

Change Controls Changes (often from the sponsor) that affect the project. Usually impacting the project's objectives, they can be compared to the agreed client/project requirements definition to decide upon their inclusion or exclusion, together with the impact that they will have. May require a revision to the project's baseline.

Chart A type of view containing a table to the left and a timescale to the right. Delineated by a divider bar. Types of chart include:

- Gantt chart
- Resource usage
- Task usage

Circular Relationship A network path that passes through the same node (task) twice; for example if task (C) is the successor to task (B), but C is also a predecessor to task (A), which is in turn a predecessor to task (B). Will cause an error in critical path analysis.

Client Requirements Definition What the client/sponsor wants from the project and often a contractual obligation. Usually contains the following headings:

- Objectives – why do it.
- Scope – project boundaries.
- Deliverables – what it will provide.
- Constraints – conditions against the project. Often presented in terms of time and cost.
- Dependant/driver projects – other related projects or parts of projects.
- Assumptions – listed unknowns about the project.
- Also referred to as a CRD or Terms of Reference (TOR).

Code A free-format field providing additional information about the resource such as cost centre or job title. This field can be grouped and filtered upon. For more sophistication, use an outline code.

Collapsing In a project's outline, a mechanism to hide normal tasks beneath their summary tasks, to see just relevant levels of detail. Usually achieved using the Hide Subtasks button. Can also be used to collapse by group and to collapse assignment detail (on task usage and resource usage views). See also Expanding.

Column As a part of a table, columns show field information for each task/resource/assignment in relevant cells.

Column Heading The grey area to the top of each column. Clicking on a column heading selects the entire column, highlighting its field for each task or resource. Double-clicking on the column heading allows a change of field or a different title for the column.

Combination View A view that contains two views. The view in the lower pane shows detailed information about the tasks or resources selected within the upper pane. The "Task Entry" view (for example) shows a Gantt chart view in the upper pane and the task form view in the lower pane. When a task is selected in the Gantt chart, the task form view displays detailed information about that task shown above. The resource allocation view is another useful combination view.

Common Resource Pool A common resource pool contains resources: people or material resources that are to be shared between a program of multiple projects. They can take two basic forms:

- A new project file that contains only resource information (no tasks), whereby all projects use this project's pool of common resources (recommended).
- Use an existing project as the "pool" project, with all projects using this project's resources. With this option, all of the resources in the pool project, as well as the projects that are sharing resources with it, are combined and available to each other.

Within Microsoft Project 2010, consider the creation of an enterprise resource pool, especially when using Project Server.

Complete Through This field indicates the progress of a task on a Gantt chart. It is the date/time that actuals have been reported up until. It is only available as a bar style.

Component Components are the building blocks of a project document. In addition to the tasks, resources and assignments, components are used to manage the project's data. They include:

- Views
- Tables
- Filters
- Groups
- Calendars
- Reports
- Forms
- Toolbars
- Maps
- VBA modules

The Organizer can be used to manage components within the project document and between project documents.

Composite Project A program file that contains one or more inserted subprojects without links to their source projects. When the composite is saved to disk, changes to the inserted projects are not reflected in their source files.

Consolidated Project A program file that contains links to one or more subproject files. The inserted projects retain links to their source projects so that any changes to them within the consolidated file are passed on to the source file when the consolidation is saved to disk.

Contoured Assignment An assignment where the hours are scheduled at a non-uniform rate. Microsoft Project's options include:

- Back loaded
- Front loaded
- Double peak
- Early peak
- Late peak
- Bell
- Turtle
- User-defined

All contoured assignments will take more time than a flat assignment (which is the default). Contours are displayed as timephased fields within the task usage and resource usage views.

Constraints A scheduling protocol that establishes when a Task should happen. Constraints (which can be flexible or inflexible) are:

- ASAP – As soon as possible (no real constraint).
- ALAP – As late as possible.
- FNET – Finish no earlier than.
- SNET – Start no earlier than.
- FNLT – Finish no later than.
- SNLT – Start no later than.
- MFO – Must finish on.
- MSO – Must start on.

See also: deadlines.

Cost The total scheduled cost for a summary task, normal task, resource, or assignment or for an entire project. This is sometimes referred to as the current cost, or budget. Cost can be simply a fixed cost for a task, or it can also include costs incurred as a result of measurable work.

Cost/Use A field that shows the cost that accrues each time a resource is used, irrespective of the work for the resource carrying out an assignment.

Cost Breakdown Structure Used as an alternative to the WBS, the CBS is a useful way to use outline codes to group the project's tasks by cost center. Sophisticated totals and subtotals can be created to determine how effectively the project is progressing, cost area by cost area.

Cost Objective One of the three project objectives. A definition of the budget available (as defined within the client requirements and project requirements documents) in cost terms to complete a project and hopefully produce all the deliverables within the project's overall scope. This often becomes the project's baseline cost or BCWS and can be compared to actual costs to determine cost variances. See also time objective; quality objective.

Cost Rate Table Defined within the resource information dialog box, resources can have a variable standard rate for the work that they will perform. Up to five rate tables can be applied, each of which can be varied over time.

Cost Variance The difference between the baseline cost and total cost for a task, resource or assignment. If a task is in progress, its total cost is actual cost plus its remaining costs. See also CV.

Count Specifies the incrementation of the major scale or the minor scale for the timescale of a chart. For example, if the unit is weeks, a count of 2 will show 1 increment (column) for every other week.

CPI Within earned value analysis, the Cost Performance Index. Calculated as the ratio of budgeted cost of work performed (BCWP) and actual cost of work performed (ACWP). CPI = BCWP ÷ ACWP. If this value is 1 then the project, summary task or task is exactly on budget. If the value is less than 1, then things are over budget; greater than 1, things are ahead of budget. See also "CV".

Critical Path The series of tasks that must be completed on time for a project to finish on schedule. Each task on the critical path is a critical task; any delay to it would delay the project's schedule.

Critical Path Analysis A method for scheduling when tasks will happen. Comprising of a forward pass and a backward pass, it determines how quickly and how slowly the tasks can be accomplished.

Critical Task A task that must be completed on schedule for the project to finish on time. If a critical task is delayed, the project finish date might also be delayed. A series of critical tasks makes up a project's critical path.

Cross-Project Links Links between tasks in different projects. Usually created within a consolidated project, cross-project links make a task within one project dependant upon an external task in another project.

Crosstab Reports Printed information about tasks and resources over a specified time period. For example, a report comprising of tasks (or resources) and assignments within the rows and periodic cost or work values in the columns. Provides similar information to a crosstab view, but with more formatting options but no data editing options.

Crosstab Views Screen-based information about tasks and resources over a specified time period. Can be seen from a task's (task usage view) or from a resource's (resource usage view) perspective. Can show work and cost values and provides editing facilities. Similar to a crosstab report.

`Ctrl` + Click Holding down the `Ctrl` (Control) key on the keyboard and clicking the left mouse button. This can be used to select more than one object when the objects are not adjacent to one another. Useful when linking tasks together with the Link Task button or removing links with the Unlink Tasks button. Can also be used in conjunction with the Task Information button to make changes to multiple tasks/resources/assignments. See also: `Shift` + Click.

`Ctrl` + `Delete` Removes the selected information within the current cell. Does not delete the entire object (task/resource) as the `Delete` key can.

Current Date The Current Date is the boundary between the past and the future. Using the PC's system date by default, it can be edited within the Project Information dialog box. Tasks between the project start date and the current date should be complete, those happening after the current date should possess remaining work. The current date display on a Gantt chart can be altered using the Gridlines dialog box (Format > Gridlines). The current date is sometimes referred to as the as-of date. See also: status date.

Custom Field A field (for Tasks or Resources) that is user-definable. Entries can be made against: cost, date, duration, finish, flag, number, outline code, start, text. Custom fields can be simply renamed or can contain value lists. A calculated field can contain a formulaic expression and also display graphical indicators. Custom fields can be defined within the Customized Fields dialog box (Tools > Customize > Fields). Custom fields are projectspecific and can be copied from project to project using the Organizer. See also: Enterprise Fields.

CV Within earned value analysis, the CV (earned value cost variance) field is calculated as BCWP - ACWP. It is the difference between how much it should have cost to achieve the current level of completion on the task and how much it has actually cost to up to the status date or the current date. A positive CV value indicates that progress against the task, summary task, project or resource is ahead of the baseline cost (under budget) and a negative value indicates that progress is currently over budget. See also: "CPI" and cost variance.