

Project Management Overview

Section 1 - Chapters 1 - 3

There is some great material in the first four chapters of the PMBOK ® Guide. The bullets and italics are very important throughout the guide. A few quick comments follow:

Page 4. “What is a Project?” is very important. We often see confusion on this issue and we have to reverse negotiate with resources for our projects. If you ask Mary how much time she is available on our project, she will tell you 60%. If Mary is doing non-project work 40% of the time and is working on three equal projects, she is only available on our project 20% of the time. If she is working on three activities on our project simultaneously, she can only work approximately 7% of her time on each.

The bullets and italics in the PMBOK ® Guide are always very important. You must make the distinction between designing a new car which is a project and producing them each day after that, which is operations.

Page 5. Projects are temporary and unique and therefore often risky. Note the italics.

Page 6. Definitions are important.

Page 8. In some ways this is the most important page in the PMBOK ® Guide. We encourage our students to copy this page and use it as a bookmark when studying. This is PMI eating its own dog food.

Work Breakdown Structure (WBS) Level 1 is Project Management. Note the definition of WBS in the Glossary on page 209.

WBS Level 2 is the information in the nine black boxes 4 to 12.

WBS Level 3 is the information in the white boxes, ranging from 3 to 6 items.

WBS Level 4 is Inputs, Tools and Techniques and Outputs for each Chapter.

WBS Level 5 contains the detail specific to each chapter.

Page 11 to 13. The concept of life cycle is very important. The project to build a bridge may take three years. The bridge may be in use for hundreds of years. Everyone will remember lousy quality long after you got to be a hero for bringing the project in on time and on budget.

This is often a great opportunity for negotiation. If you have a boss with unrealistic expectations about having software ready for Comdex, when he came to you months late, you should ask how much more money the company will make if you make the deadline. You should then negotiate for a large chunk of this to allow you to fast track your project. If necessary, you should also negotiate for more and better resources, less scope, etc.

Pages 13 to 15. In our classes, we demonstrate the importance of histograms (Figure 2-1), Cumulative or S curves (Figure 2-3) and Go/No-Go decisions. You generally don't have a realistic

schedule until you use the float to resource level and you should kill silly projects at the first opportunity before you waste these resources.

Page 16 to 17. The figures make a great Level 1 schedule for your project management software. We always try to break out by Phase and Deliverable at Level 1 rather than by Functional Group. We take a team approach to get everyone focused on the deliverables. The functional approach generally builds silos of people who hate people in other silos and is often the kiss of death for a project. See our Project Management Using Microsoft Project, (PMMP) Checklist.

Page 19. It is very important to realize where your company is on the continuum between Functional and Projectized in Figure 2-6. Functional Organizations are generally adequate at performing operations and lousy at performing projects. Projectized organizations are often superb at projects but may struggle to remain good at operations, which are often seen as less exciting. It is often extremely difficult for older companies to make the transition from Functional to Projectized.

TWG is lucky to do only projects. We use CPM schedules for just about everything so to us, Organization charts are an instrument of the devil. Many of you have to wear two hats so various organization charts are discussed on pages 20 to 23. The organization chart is pretty simple for the Projectized organization. The project manager is king or queen and everyone else is equal. The critical path governs, not the person in the corner office with the biggest rubber tree.

Pages 24 to 27. It is encouraging to see more emphasis being placed on these important leadership issues. It is pretty hard to be a great project manager without being adept at leadership, communicating, negotiating, etc.

Project Management, A Systems Approach to Planning, Scheduling, and Controlling, Seventh Edition by Harold Kerzner, PHD has some great material and perspective on these issues.

Page 31. The diagrams are very important. Please note that in Figure 3-1 the diagram is repeated for each phase. Do not try to use Figure 3-2 as Level 1 in your schedule. You will then end up with summary bars that run the length of the phase and are not very useful. See our PMMP Checklist.

Page 32 to 37. Note the difference between Core and Facilitating Processes and the historical perspective. Scope, Time, Resource Planning, Cost and Integration are the Core Planning processes while the other processes facilitate these.

Page 38 is particularly important. Note the heavy emphasis on planning although it may run against every fiber of your being. Fortunately, if you wear two hats and you do this thoroughly up front, the amount of project management work may drop off rapidly when you start

Project Scope Management

See Chapter 5 in the PMBOK® Guide.

Many students find this chapter boring but it is important to follow its recommendations before proceeding to the more exciting stuff in Time, etc. The Scope WBS is on Page 52.

1. Initiation
2. Scope Planning
3. Scope Definition
4. Scope Verification
5. Scope Change Control

Comments:

1. Note the definition of Initiation on page 53, the importance of getting authorization to proceed with a project or to continue to the next phase and of choosing the best projects. We believe that success often starts with killing or postponing less important projects to free up resources and float for the most important projects.
2. Note the outputs of Scope Planning in the PMBOK® Guide, page 56.
3. The material in Section 5.3.2 is particularly valuable. We always try to break out by phase and deliverable as shown in Fig-3. We assign project management to each of the other phases to keep the whole team focused on the next deliverable and to get a good water-fall from left to right in the schedule. It is really important to avoid breaking out by functional groups, at least until you get down to lower levels in the WBS.
4. We put the scope statements and assumptions in the notes field of the project management software and cross reference to other documents.
5. We put new impact and change activities into our schedules to demonstrate any impacts, scope changes, etc. See bullets on PMBOK® Guide, page 63. We are also great believers in performance reporting. See our PMMP Checklist and TWG Templates.

Project Time Management

See Chapter 6 in the PMBOK ® Guide.

The whole chapter is excellent. If you follow the WBS on Page 66 and do the five processes in the order suggested, you will save a great deal of iteration, time and frustration.

1. Activity Definition
2. Activity Sequencing
3. Activity Duration Estimating
4. Schedule Development
5. Schedule Control

Comments:

1. Use a strong verb and noun to define your activities in Step 1 and keep descriptions short. Scope statements, notes, cross-references, etc. should be put in the notes field for each activity, not in the activity description.
2. Use post-it notes with the whole senior team to come up with the Level 1 (Summary) schedule. Keep it simple. If you work top down, you can put in the detail later. Think logic and duration, NOT dates! See details in our PMMP Checklist – Planning, Point 1.
3. Stick to this approach. Do not work with person-hours. Durations for activities should be less than the reporting period. If you plan to report weekly, no activity at the lowest level in the WBS should be longer than 5 days. If you plan to report every four hours on a shut-down project no activity at the lowest level in the WBS should be longer than 4 hours. See our PMMP Checklist – Planning, Point 4.
4. This is the fun part. Ensure that you have a well defined, practical critical path. Use discretionary as well as mandatory logic. Use the Total Float (TF) sort to check for missing logic on activities with excessive float. Then, use the corrected Total Float to resource level. Remember that you don't have a realistic schedule if the resource demands are not realistic. Your Planned Value will also be hopelessly unrealistic and embarrassing. Save your Baseline schedule at the end of Step 4.
5. Schedule control should now be relatively easy. Update your schedule regularly. "Manage by exception" just the handful of activities that go wrong rather than the thousands that go well. Catch up activities on the critical path that are behind schedule by assigning more or better resources. Often you can borrow resources from activities that have large amounts of total float. Use Earned Value. See the Schedule Control section in our PMMP Checklist for further details.

Find a project management software package that will fit your needs. Such software is the ultimate time management tool. The new tools make this section easy and rewarding by comparison to just a few years ago. If you keep your project on schedule, it will generally stay on budget or the budget was unrealistic to start with. However, don't cheat yourself by using the tools just to manage time. With a little more work you can leverage the new tools to help you with resources, cost, risk, communications, etc.

Project Cost Management

See Chapter 7 in the PMBOK ® Guide.

Project Management, A Systems Approach to Planning, Scheduling, and Controlling, Seventh Edition by Harold Kerzner, PHD has some excellent additional material on benefit/cost analysis, depreciation, NPV, etc.

The WBS on PMBOK ® Guide Page 84 is as follows:

1. Resource Planning
2. Cost Estimating
3. Cost Budgeting
4. Cost Control

Comments:

1. Assign people, equipment and materials to the activities in your schedule. Typically you assign senior people at a low percentage, e.g. 10%, and junior people at a higher percentage. You have to take other projects and non project work into account and there is often a considerable amount of negotiation required. Use templates loaded with generic resources. See our PMMP Checklist.
2. There is something magical about getting “free” cost estimates, using the new project management tools.
3. In the bad old days you generally won the job on the basis of your cost estimate and did the schedule after the job was awarded. Budgeting was a big job because of the different Work Breakdown Structures (WBS) used in the cost estimate (high level) and in the schedule (detailed). These days this approach is almost heresy. How can you know what a project is going to cost if you don't know how long it is going to take? It is often so easy and fast to do the schedule first, particularly if you have schedule templates from previous similar projects. Remember too, that the cost baseline may not be realistic until the schedule has been resource leveled. The initial Planned Value is often hopelessly skewed and unrealistic.
4. Cost Control remains a challenge for many companies. It is often difficult to collect actual cost information at the activity level in time to correct a problem. See Project Communication Management, Chapter 10 in the PMBOK ® Guide, and our PMMP Checklist.

With application of resource demands, the schedule provides both a cost estimate and cash flow projections. Leveling remains one of the most powerful tools for increasing profits and avoiding negative impacts. The software can also be automated to calculate Estimate at Completion based on current performance.

Project Quality Management

See Chapter 8 in the PMBOK ® Guide.

Chapter 23 in Project Management, A Systems Approach to Planning, Scheduling, and Controlling, Seventh Edition by Harold Kerzner, PHD gives a great summary and historical perspective.

The WBS on Page 96 of the PMBOK ® Guide is as follows:

1. Quality Planning
2. Quality Assurance
3. Quality Control

Comments:

At first Quality Management seems much easier to apply to manufacturing than projects. The heritage, of Demming, Duran, Crosby, et al and the auto industry manufacturing, is still very evident with the concepts of prevention rather than inspection, the distinction between grade and quality and the emphasis on statistics. See Dr. Kerzner's book for an excellent summary on page 1089 and historical perspective on the preceding pages in Chapter 23.

However, it's not just the widget, it's also the process. It's no good having a great widget if it's late to market and costs too much. PMI's approach to Project Quality Management makes the previous body of work relevant to projects. Quality is not just free – it should save you money!

The tools e.g. Cause-and-Effect diagrams, Benchmarking, Pareto diagrams, etc. are particularly useful although we prefer to take Flow charts and put them into project management software. We feel this gives a lot more information about how long the process will take, how many resources it will require and what it will cost. We often tackle implementing a solution to a quality problem as a subproject with its own schedule, resources and budget, etc.

We plot Schedule Performance Index against time on all our projects. See PMBOK ® Guide page 104 and Earned Value in the Project Cost Management summary. It is our experience that if you keep your project on schedule, it will generally stay on budget and quality is much less likely to be a problem.

We also put Quality activities in each phase of our schedules, see our PMMP Checklist.

Project Human Resource Management

See Chapter 9 in the PMBOK ® Guide.

The PMBOK ® Guide says that this “includes the processes required to make the most effective use of the people involved with the project. It includes all the project stakeholders – sponsors, customers, partners, individual contributors, and others” We agreed 100%. We still see too many plans where many stakeholders’ activities are not included in the schedule or are treated as external relationships. If 99% of the activities on your schedule are your responsibility, 99% of the mistakes will appear to be your responsibility. You have to do the Level 1 schedule as a team and include everyone in your schedule.

As always, the definitions and bullets in the PMBOK ® Guide are very important.

We see too few people doing leadership and negotiation classes. This is particularly the case in industries and companies that are new to project management. Dr. Kerzner says that the most important word in project management is No! We have to learn to negotiate for realistic time frames, more and better resources, possibly less scope, more budget, etc.

The WBS on Page 108 of the PMBOK ® Guide is as follows:

1. Organizational Planning
2. Staff Acquisition
3. Team Development

Comments:

1. Staffing Requirements: Many of the project management software packages are now addressing enterprise solutions to staffing requirements. It is important to show resource histograms both for the individual and the group he/she belongs to. We don't use separate RAM's much any more. This information is so easily put into the new project management tools. Fig 9-3. Ask yourself the question is this graph skewed because design is dropping off at the end? Very often, a skew like this occurs when the schedule has not been resource leveled. See our PMMP Checklist.
2. Staff Acquisition: The PMBOK ® Guide states that the “best” resources may not be available and reiterates the importance of negotiations. On our projects, the activities that are most critical almost always get first choice on resources.
3. Team Development: We are great believers in retreats as a team-building activity. In a vigorous economy, fast reward and recognition is very important or a company may lose its best people. Collocation and war rooms can be very effective. Increasingly we are seeing our global clients produce virtual war rooms on project web sites so that everyone feels part of the team. We have found that mentoring after training classes can be very effective. We generally set up mentor-the-mentor programs so that each company has in-house experts on each of the PMBOK ® Guide areas. Performance appraisals often do not pay enough attention to team play. See page 426 of Dr. Kerzner's book, referenced below.

Project Communications Management

See Chapter 10 in the PMBOK ® Guide.

Pages 273 to 288 in Project Management, A Systems Approach to Planning, Scheduling, and Controlling, Seventh Edition by Harold Kerzner, PHD has some great information. E.g. See Fig 5-13 on page 275.

Toastmasters, Dale Carnegie and Negotiation classes are also highly recommended. Good Negotiation books and tapes include those by Roger Dawson, Effective Negotiating by Dr. Chester L. Karrass and Getting Ready to Negotiate, the Getting to Yes Workbook by Roger Fisher and Danny Ertel.

The WBS on Page 118 of the PMBOK ® Guide is as follows:

1. Communications Planning
2. Information Distribution
3. Performance Reporting
4. Administrative Closure

Comments:

Most of the material in this Chapter is self explanatory.

However we find in our classes that many people still have problems with Performance Reporting, Earned Value, etc. This section is so important in real life and in the exam. Please see the PMBOK ® Guide definitions in the Glossary starting on page 195 and the explanations on pages 123 and 124. It is easy to remember the formulae if you understand the following:

Earned Value, EV (formerly BCWP) – What's in the baseline budget * % complete.
(Once you update your schedule, the project management software will calculate this for you and give you a free invoice, etc. Many sophisticated clients and banks now insist that the invoice be prepared this way. It doesn't make sense to do it twice, once for time and once for cost!)

Planned Value, PV (formerly BCWS) – The physical work scheduled.
(The project management software will calculate this for you but don't forget to resource level your schedule first or this may be hopelessly optimistic!)

Actual Cost, AC (formerly ACWP) – From invoices and timesheets.

Schedule Variance: $SV = EV - PV$ (negative \$=trouble)

Cost Variance: $CV = EV - AC$ (negative \$=trouble)

Schedule Performance Index: $SPI = EV/PV$ (<1=trouble)

Cost Performance Index: $CPI = EV/AC$ (<1=trouble)

Hints for remembering the formulae:

There are only three terms and the EV always comes first or on top in the equation.

If you're asked for SV the answer is EV minus the schedule term, PV.
If you're asked for CV the answer is EV minus the cost term, AC.
If you're asked for SPI the answer is EV divided by the schedule term, PV.
If you're asked for CPI the answer is EV divided by the cost term, AC.
Please also remember that negative and less than one, means trouble.

We are passionate believers in EV because it allows us to "manage by exception" just the tasks that go wrong. For example, we set the filters in the project management software to find the activities that have total float less than five and SPI less than 1.0. We then move resources from activities that have large amounts of float onto these activities to catch up.

Earned Value is magic because it works at all levels in the schedule. In the example in the PMBOK® Guide on page 124 you can tell by looking at the summary that the project is 13% behind schedule and 7% over budget. You can then dive down in the WBS to find which activities are causing the problem.

Conversely, you can go up in the WBS to see how the company is performing. The following example is a client's whole organization with all 84 projects plotted over a six month period, shown months 1 to 6. Ideally, if all projects were perfectly on schedule and perfectly on budget you wouldn't deviate from the bull's eye. Your goal is to stay on the bull's eye or in the upper right hand corner. The new version of Microsoft Project handles Earned Value quite well after you customize it using the Numbers fields. We cover this in great detail in our classes because it is so important. See also our PMMP Checklist.

Project Risk Management

See Chapter 11 in the PMBOK® Guide.

Project Management, A Systems Approach to Planning, Scheduling, and Controlling, Seventh Edition by Harold Kerzner, PHD. See Risk in the index.

Kepner-Tregoe's work on Problem Analysis, Potential Problem Analysis and Decision Analysis, etc. See their web site at www.kepner-tregoe.com.

The WBS on Page 128 of the PMBOK® Guide has changed dramatically from the previous edition and is now as follows:

1. Risk Management Planning
2. Risk Identification
3. Qualitative Risk Analysis
4. Quantitative Risk Analysis
5. Risk Response Planning
6. Risk Monitoring and Control

Comments:

We have always admired the entrepreneurial, risk taking approach in the PMBOK® Guide. The second sentence on page 127 states "It includes maximizing the probability and consequences of positive events and minimizing the consequences of adverse events to project objectives."

Projects are inherently risky because they are unique. If you don't like risk, don't do projects. Your boss has to remember that the person who never made a mistake, never made anything! "Management by Exception" (MBE) discussed above, only works if there is sufficient trust in the organization to concentrate on the things that went wrong and how they will be fixed. We have seen first hand the dramatic difference that MBE can make. Companies that adopt it generally have great morale, team spirit and productivity, less bureaucracy and thinner reports, successful projects, etc. It is very difficult to change a culture that unduly punishes honest mistakes. It may be better to leave and find a company with more potential.

You can easily customize Microsoft Project to do much of the arithmetic on pages 136 and 137 of the PMBOK® Guide for you. E.g. you use one of the Number fields to put in the Impacts for each activity. We generally just put in Moderate 0.2, High 0.4 and Very High 0.8. Use the next Number field to enter Probability. We generally just enter 0.5, 0.7 or 0.9. Use a third number field to calculate the product or Risk Score e.g. 0.8 Impact * 0.9 Probability gives a Risk Score of 0.72 shown in the top right hand corner on Fig 11-3. We can then use the Microsoft Project filters to find just the activities with Total Float less than 5 days and Risk Score greater than 0.18. The software can also turn on a colored flag to highlight risky activities.

Decision Tree Analysis as shown in Figure 11-6 can be great for brain storming. "Solving the decision tree indicates which decision yields the greatest expected value ... when all the uncertain implications, costs, rewards, and subsequent decisions are quantified." Don't take these solutions at face value though. Look for solutions that can make a huge difference to the expected value.

In the example, the cost of building a new plant is \$120 (million?) vs. \$50 to upgrade the existing plant. If there is a strong product demand, the payoff will be \$200 for a new plant vs. \$120 for the

upgraded plant. If there is a weak product demand, the payoff will be \$90 for a new plant vs. \$60 for the upgraded plant. At face value, the pay offs are as shown in Scenario A and you should choose to upgrade the existing plant. However, note the sensitivity of the calculation. If it costs \$70 to upgrade the existing plant instead of \$50 the decision is reversed as shown in Scenario B below. It is so easy to look at different scenarios in project management or spread sheet software.

DECISION	COST	PAYOFF	PAYOFF - COST	PROB	PRODUCT	NET PATH VALUE
SCENARIO A						
Build New Plant	120	200	80	0.65	52	
Upgrade Existing Plant	50	120	70	0.65	45.5	
	50	60	10	0.35	3.5	49
						Choose
SCENARIO B						
Build New Plant	120	200	80	0.65	52	
	120	90	-30	0.35	-10.5	41.5
						Choose
Upgrade Existing Plant	70	120	50	0.65	32.5	
	70	60	-10	0.35	-3.5	29
						Choose

We became great believers in Kepner Tregoe’s Potential Problem Analysis years ago when a brain storming session revealed a risk that could be avoided for a cost of \$7,000. This decision saved us \$3 million a few weeks later.

Litigation has become a huge risk in the USA for many industries e.g. construction in public agency work. See our comments on Mediation under Claims Resolution support.

The PMBOK ® Guide talks about Avoidance, Transference, Mitigation and Acceptance on pages 142 and 143.

One example of transference is to contract the work to others which is covered in the following Project Procurement Management Chapter.

Project Procurement Management

See Chapter 12 in the PMBOK® Guide.

Project Management, A Systems Approach to Planning, Scheduling, and Controlling, Seventh Edition by Harold Kerzner, PHD – Chapter 24 pages 1139 to 1163.

The WBS on Page 148 of the PMBOK® Guide is as follows:

1. Procurement Planning
2. Solicitation Planning
3. Solicitation
4. Source Selection
5. Contract Administration
6. Contract Closeout

Comments:

The PMBOK® Guide discusses project procurement management from the perspective of the buyer in the buyer-seller relationship but it is easy to reverse roles if you are the seller. It points out that “A contract is a mutually binding agreement that obligates the seller to provide the specified product and obligates the buyer to pay for it. A contract is a legal relationship subject to remedy in the courts.” However the PMBOK® Guide does not pursue the legal aspects in much depth.

Mr. Walt Derlacki, ex-president of the Puget Sound (Seattle) Chapter of PMI makes the point that the Legal aspects, disputes prevention and resolution, liability, etc. and Negotiations should receive much more emphasis. He covers legal aspects superbly in the section he wrote for the Seattle PMI Chapter. Negotiations books are referenced in Communications.

It is important as an owner not to give up too much control to contractors, particularly in high risk or public agency work. There has been a huge shift in power in recent years with the invention of the personal computer (PC). In the construction industry, owners and consultant teams can now do the work that only a large general contractor, with mainframe project management computers and software, could do 20 years ago. An owner can now use a PC to fast track and maintain control of his own project using multiple contractors, matched contracts and liquidated damages. He should insist on good schedules and EV from his contractors. See our case study.

Dr. Kerzner spells out the different types of contracts, their advantages and disadvantages and the different risks involved, in Chapter 24 of his book.

Project Integration Management

See Chapter 4 in the PMBOK ® Guide.

Project Management, A Systems Approach to Planning, Scheduling, and Controlling, Seventh Edition by Harold Kerzner, PHD

The WBS on Page 42 of the PMBOK ® Guide is as follows:

1. Project Plan Development
2. Project Plan Execution
3. Integrated Change Control

Comments:

We normally study this chapter as a summary rather than an introduction. We like the emphasis on Earned Value as an integration tool, on corrective action and on Integrated Change Control. We often see too much emphasis placed on “lessons learned” and too little on corrective action. “We’re late, over budget and the quality is lousy, but look at all the lessons we learned!” This approach is not good enough!

We use Earned Value to “manage by exception” just the tasks that go wrong e.g. activities with less than five days float and $SPI < 1.0$. Each day, we move resources to these activities from activities that have float.

Dr. Kerzner has some excellent ideas on integration at the beginning and though out his book.