

PMP Exam Tips on Time Management

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Parallels between Cost and Time estimating:



There are strong parallels between **Cost** estimating and **Time** estimating.

The WBS is the “big picture” and contains the entire project, so it should be no surprise that the WBS is a major input to the cost estimating process.

Two of the more difficult knowledge areas in the exam are Professional Responsibility and Time.

Part of the reason is (I think) that Professional Responsibility is underestimated during study, and with Time questions it’s necessary to work out manually what project management software does for us automatically. Just a reminder here – there are no questions on specific project management software in the exam, so MS Project and Primavera etc won’t rate a mention.

Newly added in PMBOK Third edition is the concept of a management plan for each knowledge area. The Time Management Plan is a “plan to plan” for time and it organises and controls how you will manage time management to it and perform the functions of scope management during project execution.

As with the other knowledge areas, Time Management is recursive (looped-through throughout the project) and progressively elaborated (during the recursions, details are finalised and fed back into the scope plan, WBS, WBS Dictionary, Activity List and so on, so that a clearer and clearer picture of the project emerges)

Important points

When trying to understand the PMBOK, bear in mind the viewpoint of PMI. PMBOK projects are humongous, so you can forget about your, “Planning Auntie’s birthday party” size projects. This is partially because the PMBOK was originally largely based on the project management tools and techniques from the early space program. So project management isn’t rocket science, but it’s related to it. The other factor to bear in mind is that often the project manager is considered to be an employee of the organization.

Recap on Scope Management

In Scope Management you defined what the project will and won’t deliver (the Scope Statement). Next the deliverables were decomposed (broken down) to “work packages” (lowest level deliverables), using the WBS. The WBS contains only deliverables (nouns) and no activities (verbs). The WBS is not time ordered, so e.g. it could show a roof being constructed before the foundation is laid. This is ok because the WBS does not contain the schedule; in fact the goal of project management is to schedule the delivery of every

deliverable on the WBS. The schedule, to be developed in Time Management, is of course time ordered.

So the deliverables at the bottom of the WBS are called “work packages”, the deliverables at the top of the WBS (i.e the first level under the main project) are called, “control accounts”, and the deliverables in between are called “planning packages”. Each box on the WBS has a unique code number, e.g. 3.1.2, and the collection of all code numbers in a WBS is called the “code of accounts”. The code of accounts is used to determine the level of any work package within the WBS, and by assigning each code in the code of accounts to a code in the chart of accounts (in the organizations general ledger), the cost associated with any item in the WBS can be tracked throughout the project.

When we come to Time Management we create an extension to the WBS called the Activity List. The Activity Definition stage decomposes (breaks down) the work packages into the tasks needed to deliver them.

After the activities are defined you will need to estimate the resources for each task.

After completing the duration estimates, the next step is to estimate the duration for each activity, then the scheduling step attempts to get everything in the right order and the right time.

You need to know how activity estimates are arrived at.

"Analogous" a comparison with previous (or parts of previous) similar projects, and the amount is then multiplied by an estimated “complexity figure”. This information comes from your organizational process assets. This is a top-down approach, so it costs less than other more detailed methods, but of course is less accurate. Sometimes this method is used to provide a “ball-park figure”, and is followed up by one of the following methods.

Note that for analogous estimating it is very important of course that the projects being compared are truly similar (and that the conditions are similar, e.g. an outdoor construction project in winter might be quite different in summer). Again, Analogous Estimating is a form of expert judgment (the “expert” is the ever-popular organizational process assets).

Parametric estimating uses a parameter e.g. if we know how long it takes to apply a square meter of finish-plaster then we multiply the total area to be plastered, by this figure (parameter) to arrive at the total time for this task. In the building industry this sort of information can be found in commercial tables – the same is not generally true of the IT industry (e.g. unlikely to find tables of “lines of code per hour”, and if you did they would probably be rubbish. on the other hand, use a quantity to predict how long activities will take. Consider any unit such as square feet painted per hour or number of units created per day.

CPM is the most common schedule developing method (certainly in the exam), followed by PERT and then GERT.

GERT is the only network diagramming method that can cater for loops and conditional branching

Lag is a positive time added to a task to cause it to wait (e.g. time for concrete to cure).

Lead is negative time added to speed a task up. So if you are painting a room and the required time to paint the whole room is 4 hours, and the paint as to dry for two hours before you can apply the second coat, then it will take you 8 hours to put two coats of paint on the room. But suppose when you have finished painting the first coat on half of the room (which takes 2 hours), then a second person can start applying the second coat, so the total time to paint the room with 2 coats of paint is now just 6 hours, because of the 2 hour lead on the second painter. Note this reduced the duration of the total task, but the level of effort is still the same ($2 \times 4 = 8$)

Compressing project time:

Fast tracking arranges tasks to be performed in parallel rather than in succession. This can reduce the project duration (not the labor), but at an increased risk. To remember this, image two high-speed trains one the track and heading the same direction. The second train can't arrive with passengers until the first train has unloaded. Now imagine two high-speed trains on parallel tracks arriving at parallel platforms around the same time, so trains in parallel on fast tracks deliver the passengers sooner. Note that fast tracking increases risk because it introduces dependencies.

Crashing means adding resources to activities to decrease their duration, which usually increases cost, but watch out for efficiency loss – e.g. if a person can unload a truck in 2 hours, 2 people should take 1 hour – but they may take 1.15, because they get in each other's way a bit. And if there's only one forklift, then you may be paying for one person to stand idle. Or even worse – what if your forklift truck driver has to teach the new driver, then you may get no work for a while. To remember this, Imagine your project area is full of Keystone Cops and they're running around and crashing into each other – in fact that's what can happen on a real project. So this is how you remember what crashing means – adding more people.

Crashing doesn't always work, e.g. If a man and a woman can produce baby in 9 months, how many men and women would it take to produce the same baby in one month? Even though it's impossible – how many men to you think would be willing to try?

Remember that overtime is still considered crashing, because you are still increasing resources (or parts of resources).

Monte Carlo Analysis is a computer simulation to estimate the many possible variables within a project schedule. Produces probable ranges of dates, not exact dates.

Resource Leveling is another tool the project manager can use. In this case the project has peaks of activity then troughs. Resource leveling smoothes out the project schedule so resources are not over-allocated.

The Critical Path in a project usually has zero float, and is the path with the longest duration to completion, but takes the shortest time to complete. There can be more than one critical path in a network diagram. Should delays happen on near-critical paths, and all float is consumed, the critical path may suddenly change, so monitor the CP(s) and near-CP's

The project schedule is a calendar-based system used to predict when the project, and work, will start and end, it is sometimes mistakenly called the "project plan"

Gantt charts map activities against a calendar, a true Gantt chart does not show the relationship between activities.

Milestone charts show when key deliverables are expected; they do not show the relationship between activities.

A Gantt chart is:

- Not a project management plan
- A weak organizing tool (WBS and network diagrams are strong organizing tools)
- Created from a WBS/Activity List and/or network diagrams
- A good communication tool.
- Real Gantt charts do not show task interdependencies or resource assignments (forget about what MS Project "Gantt charts" show, the exam will consider a genuine Gantt chart).

Problematic areas in exam:

- Manually calculating network diagrams
- Schedule development

Other Exam Tips

A "three-point estimate" is not the same as a PERT estimate, it is simply $(\text{pessimistic estimate} + \text{optimistic estimate} + \text{most likely estimate})/3$

A network diagram is created after the WBS has been decomposed into work packages (i.e. from the lowest level of the WBS), and after the WBS has been decomposed into an Activity List.

You need to understand PDM (Precedence Diagramming Method – also called AON or Activity on Node) as well as Activity on Arrow (AOA) for the exam –

BUT PDM is the main one.

AOA has only finish to start dependencies and cannot manage multiple predecessors (uses "dummy activities" for this – frequent exam question).

GERT rarely appears in the exam and when it does it's a very simple question, such as:

Which of the following best describes GERT?

- A. PDM
- B. Network template
- C. Conditional diagramming methods
- D. ADM

The Project Manager does not estimate task duration, that's done by the people who will do the work – but the PM has to provide them with sufficient information to do an estimate, and then gives the estimate a reasonableness check.

The WBS should be created in conjunction with the team – not by the PM alone.

WBS updates are called “refinements”.

Dependencies:

- Hard logic (mandatory logic) set by nature of work – have to build computer before installing software; have to build walls before roof.
- Soft logic (discretionary or preferential logic) Your choice – paint the outside of the house before or after the inside (normally use experience to make sound choice)
- External e.g. set by Government agency, Union, major supplier etc.

Common mistake on exam – when squaring a number, people often multiply by 2 instead of multiplying the number by itself – now you've no excuse 😊

N.B. Some project managers may have different viewpoints or opinions to those expressed here – but PMI are marking your exam, so the PMBOK is *always* right and if I say anything that appears to contradict the PMBOK, then believe the PMBOK.

PS I've made every effort to get this right to help you in your exam – but if I've missed something please let me know.

Regards, Jim Owens PMP

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