Tips and Techniques to Pass the PMP® Exam
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Introduction
Passing the Project Management Professional (PMP)® certification exam can seem like a daunting task when project managers first decide to take the leap. Just like a project management plan, if you carefully map out your study plan, you will be successful. You must understand several key concepts, be intimately familiar with the five process groups and ten knowledge areas, understand project management terminology, and learn to think like PMI. It is also important to set study goals, create a schedule for success, and commit fully to passing the exam in order to obtain your PMP® credential. Following the best practices outlined here can put you on the road to certification and will have you prepared for your PMP® Boot Camp. Everything that you need to understand prior to Boot Camp is listed here.

Terminology
There is a large volume of terminology associated with project management, but there are some key terms that you must be aware of as you are preparing for your exam. Learning these terms before your PMP® Boot Camp will have you ahead of the game and not playing catch-up (these definitions are not taken word for word from the PMBOK Guide®, 5th Edition):

**Analogous Estimating:** Estimating based on a previous, similar activity or project. Think of it as making an analogy; comparing two similar things.

**Baseline:** An approved plan that provides a point of comparison for actual performance. The baseline includes both the original plan and all approved changes, and can only be modified on the basis of formally approved changes via the established change control process.

**Change Control System:** The formal and documented system on how changes to the project will be identified, evaluated, and approved or rejected. It is part of the Configuration Management System and is the approved way to make changes to project deliverables or documentation.

**Contingency Reserve:** The amount of funds or time needed above the estimate to deal with known-unknowns. This is set aside to reduce the risk of going over budget or schedule.
**Critical Path:** The longest time path through the project’s activities workflow (that is, the schedule network diagram).

**Crashing:** A schedule compression technique that focuses on the critical path and attempts to reduce its duration by adding resources to those activities.

**Earned Value Management:** A management methodology that provides a means for evaluating the integrated performance of cost, schedule, and scope to determine both the current project status and to forecast future project performance.

**Fast Tracking:** Conducting work in parallel that would normally be done in sequence. This is a way to compress the schedule when your project is falling behind schedule.

**Functional Organization:** The traditional work organization where employees are grouped by specialized departments, i.e., accounting, marketing, operations, which are led by a department manager.

**Matrix Organization:** An organizational structure where project managers share responsibility with functional managers for assigning and prioritizing work. This is where project managers and functional managers share resources. A strong matrix organization yields more control of resources to the project manager. A balanced matrix organization is one where the functional manager and project manager have nearly equal authority over resources, but the responsibility for performance evaluation and discipline remain with the functional manager. A weak matrix organization is an organization where functional managers retain authority over resources and those resources may be dedicated to the project only on a part-time basis. For the purpose of the PMP® exam, always assume that any questions related to a matrix organizational structure are asked from the perspective of a balanced matrix, unless explicitly stated otherwise.

**Parametric Estimating:** An estimating technique that uses historical data to establish a measurable unit that can be used to calculate an estimate for a similar project. This is like saying it cost $5.00 per square foot to install flooring in the last factory we built, so the cost should be similar this time because the project is similar, so with 5,000 square feet of flooring to install, then the cost should be $25,000.

**Portfolio:** A collection of projects or programs and other work that are managed as a group in order to achieve a strategic business objective.

**Program:** A group of related projects, subprograms, and program activities that are managed together to achieve efficiency, control, and unity of effort that could not be achieved by managing them separately.

**Progressive Elaboration:** Continuous refinement and improvement of a plan as more information becomes available. This is how you get the most complete and accurate plan.
**Risk:** An uncertain event or condition that can have an impact on the project’s objectives. The impact can be positive or negative.

**Scope:** The sum of the products, services, or results to be delivered as a project. What the project is supposed to accomplish.

**Statement of Work (SOW):** A narrative description of products, services, or results to be delivered.

**Variance:** A quantifiable deviation that is measureable against an established baseline or value. Once identified, a variance is analyzed to determine the cause so that steps can be determined to bring performance back in line with the plan.

**Work Breakdown Structure (WBS):** A hierarchal decomposition of the work to be executed by the project team to accomplish all the project work and achieve the project’s objectives.

This list is not all encompassing, but if you know these basic terms, you will be well on your way to certification. Passing the PMP® exam is the end goal, but it is important to remember the requirement for 35 contact hours of instruction that you need to sit for the exam. Knowing project management terminology prior to getting those 35 hours will make the academic portion of the requirements much more manageable.

**Earned Value Management (EVM)**

Dealing with numbers is something that most project managers are accustomed to. In order to pass the PMP Exam, you have to be comfortable with earned value management (EVM). EVM is nothing more than a way to monitor and control the costs of your project. As project managers, we have a responsibility to keep the project on schedule and on budget. Understanding these concepts ahead of PMP® Boot Camp will ensure success:

**Planned Value (PV):** This is the authorized budget assigned for the work to be performed at a point in time. This is equal to the Budget at Complete (BAC) at the end of the project plan.

**Earned Value (EV):** The value of the work that has been completed to date in terms of the approved budget for that item of work.

**Actual Cost (AC):** The actual amount of money spent to accomplish all of the work performed to date. This can be direct costs only or direct and indirect costs together.

**Schedule Variance (SV):** The difference between the Earned Value and the Planned Value. The formula is $SV = EV - PV$. An SV of zero means you are on schedule. An SV that is negative is bad. An SV that is positive is good. This is easy to remember. Negative is bad. Positive is good. If you are positive, you are ahead of schedule. This calculation and the SPI determination below are relative to the schedule for creating value in the project, not the calendar-based schedule.
**Cost Variance (CV):** The difference between Earned Value and Actual Cost. The formula is $CV = EV - AC$. A CV that is negative is bad. A CV that is positive is good. This is also easy to remember. If you have a positive number, you are under budget.

**Schedule Performance Index (SPI):** The SPI reflects the relative amount the project is ahead of or behind schedule as a ratio. The formula is almost the same as SV, except here you divide EV by PV. The formula is $SPI = EV / PV$. An SPI greater than one is good. An SPI of less than one is bad. If EV is currently at $100.00 and PV is $80.00, then you have an SPI of 1.25 and you are ahead of schedule.

**Cost Performance Index (CPI):** The CPI is the ratio of the approved budget for work performed to what you actually spent for the work. The formula is almost the same as CV, except here you divide EV by AC. The formula is $CPI = EV / AC$. A CPI greater than one is good. A CPI of less than one is bad. If EV is currently at $80.00 and AC is at $100.00, then you have a CPI of 0.80 and you are over budget.

These are the very basic EVM terms and formulas that you should be familiar with before you take your Boot Camp. If you go into your 35 contact hours and already know these EVM concepts, the rest of EVM will be easy to understand and master.

### The Five Process Groups

Learning the five process groups outlined in *A Guide to the Project Management Body of Knowledge (PMBOK Guide®), Fifth Edition*, is essential for success. It is not enough to be able to list what the process groups are; you also need to know what each group is designed to accomplish.

**Initiating:** This is the process group where all the information to get the project started and authorized is assembled. Here, the project must be acknowledged by the creation of a project charter, and a stakeholder register is created as stakeholders are identified. There are two processes in the initiating process group.

**Planning:** As evidenced by the name of the process group, the planning process group is all about coming up with the plans that will guide and sustain your project. This process group has 24 processes, nine of which involve developing the subordinate management plans that support the overall project management plan.

**Executing:** The executing process group is all about getting the teams that are working on the project to accomplish the project work according to the project management plan. Work needs to be done within scope and within the agreed-upon schedule and budget. There are eight processes in the executing process group.

**Monitoring and Controlling:** This is the process group where performance is measured, risks are responded to, and the deliverable of the project itself is validated. This is also where project managers verify that approved changes have been integrated into the deliverable and project management plan. The monitoring and controlling process group has eleven processes.
**Closing:** The closing process group has two processes that are designed to bring the project or phase to an orderly conclusion. The closure of contracts and procurements and the archiving of information are critical to end a project the right way. It is also important here that official acceptance of the deliverables is achieved by obtaining customer sign-off.

The key to success here is to place the information on flash cards and focus your efforts on the areas where you need improvement. Global Knowledge’s PMP® Exam Prep Boot Camp course materials contain a set of flash cards and also a diagram of the five process groups and the ten knowledge areas.

**The Ten Knowledge Areas**

All ten of the knowledge areas outlined in the *PMBOK Guide®* follow the same naming convention. Many times they are only referred to by the middle word of the knowledge area, i.e. Project Integration Management is referred to simply as Integration. The knowledge areas are the skills that a project manager must master in order to effectively manage a project.

**Project Integration Management:** Integration management is the knowledge area that is dedicated to identifying and defining the work of the project. Integration also deals with incorporating change effectively into the project. There are six processes in the integration knowledge area.

**Project Scope Management:** Scope management is concerned with defining the scope of the project requirements and project work, creating the work breakdown structure, creating the scope baseline, and controlling the scope of the project. This is where you plan how you will keep the project within the established boundaries. There are six processes in the scope management knowledge area.

**Project Time Management:** The time management knowledge area is where the project manager estimates how long tasks will take, sequences the tasks, and estimates what resources are needed to accomplish the project. This is also where the schedule is controlled to keep the project on track. There are seven processes in the time management knowledge area.

**Project Cost Management:** In the cost management knowledge area, costs are estimated and the budget baseline is established. The plan to manage and control costs falls within the cost management knowledge area as well. The cost management knowledge area has four processes.

**Project Quality Management:** The quality management knowledge area is where the quality requirements for the project deliverables is planned, tracked, and quality issues are dealt with. There are three processes within quality management.

**Project Human Resources Management:** The HR management knowledge area includes the processes necessary to define how human resources will be utilized, acquired, developed, and managed. The human resources management knowledge area has four processes.
**Project Communications Management:** Communications management is the knowledge area that defines how communications within the project will work. In these processes, the project manager makes the communication management plan, ensures the plan is followed, and controls information flow within the project. The communications management knowledge area has three processes.

**Project Risk Management:** There are six processes within risk management. These processes involve planning risk management, identifying risks, conducting risk assessments, the responses that will be implemented if risks do occur, and controlling risks. Risk management is focused on identifying, analyzing, and planning responses to both threat (negative) risks and opportunity (positive) risks.

**Project Procurement Management:** The procurement knowledge area addresses the processes that project managers follow to acquire needed materials for the successful completion of the project. This involves formulating the plan to conduct procurements, actually conducting procurements, how we control those procurements, and then closing out the procurements. There are four processes in project procurement management.

**Project Stakeholder Management:** The stakeholder management knowledge area encompasses the processes used by a project manager to identify and satisfy those who are affected by the project, whether they are internal or external to the project. Close attention needs to be paid to those stakeholders who can have a profound positive or negative impact on the project. There are four processes in stakeholder management.

There are several mnemonics that can be used to remember the five process groups and ten knowledge areas. For the five process groups, the most common is **IPECaC**, Initiating, Planning, Executing, Controlling, and Closing. For the ten knowledge areas, an easy one to remember is “**I Saw Two Crows Quietly Having Coffee and Reading Poetic Stories**,” to represent Integration, Scope, Time, Cost, Quality, Human Resources, Communications, Risk, Procurement, and Stakeholder management.

**Enterprise Environmental Factors (EEFs)**

EEFs are used as an input for nearly all of the Planning Process Group’s processes, so it is important that you understand them as you prepare for the PMP® exam. These can be explained as both internal and external factors not under the direct control of the project team that influence your project. These can be factors that enhance your ability to manage your project, or they can be factors that constrain that ability. A good way to remember what EEFs are is to picture your own organization (the Enterprise) and its culture and structure (Environmental Factors). Is your organization a functional, projectized, or matrix organization? The answer will affect how your organization deals with projects and, therefore, will affect how you construct your project management plan and its sub-plans.

**Typical Enterprise Environmental Factors**

- Organizational Culture (Office or Telecommute, vacation policies, etc.)
- Structure (Matrix, Functional, Projectized, Composite)
- Regulatory Environment
- Market Conditions
As you prepare to take and pass the PMP® exam, the most important thing to remember about EEFs is that they are inputs to most planning processes and that they are usually factors that project managers themselves cannot rapidly change. EEFs are always an input.

**Organizational Process Assets (OPA)**

OPAs are the documents, templates, standard operating procedures, historical data, lessons learned, etc., that your organization has built or collected over a period of time that assist you in managing your project. OPA updates are an output from many processes in the Executing, Monitoring and Controlling, and Closing process groups. The reason that they are outputs to these processes is because as we execute and control the project, we learn new things that we can add to our templates and procedures. What OPAs do for project managers is prevent them from reinventing the wheel each time they do a project. The pre-existing project management plans from previous projects are a valuable resource to reference for the next project. For the PMP® exam, remember that OPA updates will be an output for many Executing and Monitoring and Controlling processes. OPAs are always an input.

**Management Plans within the Project Management Plan**

There are several different management plans that become sub-plans to your project management plan. Knowing the basics of these plans will set you up for success before you go to your PMP® Boot Camp and sit for your exam.

**Scope Management Plan:** The scope management plan is very important. This describes how the project team and manager will define, develop, and verify the scope of the project. It also defines how the Work Breakdown Structure (WBS) will be created and defined. Scope management is critical to the success of the project.

**Requirements Management Plan:** The approach to identifying, collecting, analyzing, documenting and managing requirements is defined within the requirements management plan. The plan may also include descriptions of the configuration management activities, phase relationships, prioritization processes and the traceability approach.

**Schedule Management Plan:** The schedule management plan identifies the processes used to manage the schedule during the project. It also defines the schedule development approach. The plan defines who is responsible for tracking and reporting schedule progress, how schedule updates are received and incorporated, how variances and changes will be addressed, and how to baseline the schedule.

**Cost Management Plan:** The purpose of cost management is to ensure the project team and contractors will complete the project within budget. This cost management plan identifies the processes used to manage costs throughout the project’s life cycle. It should address the cost management approach, expense tracking, variance analysis, monitoring of contractor costs, and reconciliation between the organization’s budget, accounting, and project management cost processes.
Quality Management Plan: The quality management plan identifies how the organization’s quality policy will be implemented and how the quality requirements for the project will be met.

Process Improvement Plan: The process improvement plan defines how processes for improvement will be identified and analyzed, and the steps necessary to increase the value of a process. The process improvement plan applies to both project management processes and to product development processes.

Human Resources Management Plan: This plan defines how the people that work on the project will help to ensure project success. Once activities are defined, the project manager has to assign human resources against those requirements. This plan should also detail expectations of the project team and the responsibilities of those on the team. EEFs are important when constructing this plan.

Communication Management Plan: The communications management plan should address the approach, constraints, and requirements that apply to communication within your project. It should list a directory of the project team(s), the methods used (e-mail, phone, VTC, etc.), standards (what is expected of whom), and an escalation process to ensure that your project’s communications are well-defined.

Risk Management Plan: Every project faces risks. Formulating an effective risk management plan is how project managers mitigate risks and seize opportunities. The risk management plan is the document that defines how to recognize risks (or opportunities), estimate the impact of those risks, and define a response to the risk. The risk management plan should also define any specific risk management responsibilities to project team.

Procurement Management Plan: The procurement management plan formalizes policies for the procurement requirements of the project, how procurements will be managed, and documentation requirements. This plan will address issues such as items to be procured, contract types to be used, and how procurements will be coordinated with the project scope, schedule, and budget.

Stakeholder Management Plan: The stakeholder management plan identifies and documents the approach that the project team will take to increase or maintain stakeholder support and prevent negative stakeholder impact. The plan should specify how to identify all stakeholders, identify who the key stakeholders are, and how the stakeholder analysis will be done. Based on the stakeholders’ power and interest in the project, a strategy will be defined to manage each stakeholder.

The Work Breakdown Structure (WBS)
The WBS is an important part of the project management plan. Essentially, the WBS illustrates how the work described within the project scope statement will be broken down. It is usually illustrated in a hierarchal tree structure to make it easier to understand. It will identify deliverables and work packages by dividing the work into manageable components. The WBS is created through a process called decomposition. In other words, large work pieces are broken down into smaller, more measureable components. The WBS must include 100% of the work that is required to complete the project, including project management activities. The idea is to plan outcomes, not specific actions. The decomposition of the WBS stops at the work package level, where a work package is understood to be the lowest level deliverable on each branch of the WBS.
The Project Charter

The project charter is the document that formally recognizes the creation of a project and authorizes the allocation of resources to that project. Many times, the project charter is created based on a feasibility study or business case that has been prepared in support of the project. For the purposes of the exam, you have to understand that the charter is the birth certificate of the project. The project charter is created by listing the initial scope, objectives, and potential participants in the project, and requires approval or signature from a project sponsor or initiator.

Work Performance Data

Work performance data is a new term in the PMBOK Guide® and refers to the raw, unanalyzed observations of actual performance. Work performance data is the basis upon which work performance information is developed.

Work Performance Information

Work performance information is described as the analysis and integration of work performance data from across areas of the project. The merging of the Distribute Information and Report Performance processes from the fourth edition of the PMBOK Guide® into a single process, Control Communications, in the fifth edition, may cause some people to forget about this requirement. How you collect and distribute this information should be addressed in the human resources management, communications management, and stakeholder management plans. You should be able to rely on already established standards within your organization (OPAs) to provide you with a format to report work performance information. Work performance information can lead to the generation of change requests in several of the processes in the executing process group. It is also an input to several of the processes in the monitoring and controlling process group. Key take-away: output of execution, input to monitoring and controlling.

Work Performance Reports

Work performance reports are the documented representations of the organized and compiled work performance information. These reports are used to provide awareness to the stakeholders and as a basis for decision-making.

Inputs

All of the various processes have inputs that are synthesized using tools or techniques to produce outputs. Most of the outputs from the 47 project management processes become inputs to other processes. There are between two and thirteen inputs for each process, and it is important to be familiar with most of them. It isn’t reasonable or necessary to memorize the 256 different inputs that contribute to the 47 processes, but knowing their logical associations can help you to categorize the inputs in your mind. For example, the Create WBS process has five inputs: the scope management plan, scope statement, requirements documentation, EEFs, and OPAs. For the exam, remember that EEFs and OPAs are inputs to many of the processes.
Outputs
All of the project management processes produce outputs. As with inputs, it is not reasonable or necessary to memorize the 153 outputs produced through the 47 processes. What is important to know is that project document updates are one of the most common outputs. Again, looking at the Create WBS process, the two outputs are the scope baseline and project document updates. If you think logically through what each process is intended to accomplish, you should be able to remember many of the outputs for each of them.

Postmortems
The project postmortem (or post implementation review) is done as part of the Close Project or Phase process. It is an important component of project closure. Each organization does their lessons learned in different ways, just remember that these reviews become part of your organizational process assets. The postmortem is not meant to be a witch hunt where issues are blamed on individuals or contractors. It is a learning tool used to assist the organization in future projects. Key achievements of the project team and items that are actionable for future improvement are listed here. This is also where the team measures actual outcomes against the project plan. The postmortem is the official end of your project.

Exam Patterns and Information
The PMP® exam consists of 200 questions, 175 of which are scored for your overall exam grade. There is no real way to know if an individual question is a graded or non-graded question. Twenty-five of the questions are placed in the exam for the purpose of validating them for possible future inclusion. Once you go through the administrative portion of showing up for the exam and providing your identification, you will be seated in an exam booth. You will be given scratch paper and a pencil for making notes. You will have fifteen minutes prior to the exam to take a tutorial and to do your “brain dump.” The brain dump is critical to your success on the exam.

During your brain dump, the first thing that you should do is create a five by ten chart and fill in the five knowledge areas and ten process groups. Next, populate the 47 processes so that you have them there for quick reference. If you find yourself forgetting a process, that’s okay. Come back to it and fill it in later. Some questions on the exam may remind you of the process you left off the chart. After you create your chart, write down your EVM formulas. At a minimum, write down the formulas for schedule and cost variance, and schedule and cost performance indexes. Write down as many formulas as you can remember. Normally, your short-term memory can hold seven to ten pieces of information. If you have not committed the formulas to your long-term memory before exam day, quickly absorb them the morning of the exam and make them the first thing you write down upon sitting down for the exam.

When taking the exam, look for patterns in each question. What establishing patterns can do is help you to eliminate answers that don’t fit with the question. There are times when a question will ask what the outputs from a certain process are. If that is the case, look for something that is not a result, and eliminate it. The exam is multiple-choice, so the answer will be right in front of you. Give extra scrutiny to questions that:

- Use words like **always** or **never**
- Use phrases like **except for or have to**
- Have the words **best, worst, most, least, first, and last**
Always try to determine what the question is looking for. Is it looking for an input, an output, a process, a knowledge area, or a process group? If you can determine what process group or knowledge area the question belongs to, it will help you to significantly reduce the spectrum of possible answers.

Now that you know what to study, it is time to get on track and make a plan. I recommend that you begin by obtaining a copy of the *PMBOK Guide®, Fifth Edition*, and begin to read a chapter each night and take notes. Draw out the important concepts and pay special attention to information that you have not heard before. This type of information needs to go on your flashcards. After you have read the entire *PMBOK Guide®,* it is time to work your flashcards. Divide your flashcards into sections like formulas, terminology, and concepts. Go through them daily and move the flashcards that you have committed to memory into one pile and keep another pile for cards that need more work. As you go through the cards, the “needs more work” pile will get smaller and smaller. Once you get this pile down to about 10 percent of your cards, it is time to start creating your dump sheets. It is a good idea to create a dump sheet for yourself at least once a day so that your brain gets used to recreating the sheet. Put formulas and the process groups on it as a minimum. Once you can create your dump sheet and have your flash cards memorized, it is time to schedule your boot camp. Your PMP® Exam Prep Boot Camp will provide you with the contact hours you need to become certified and will reinforce the concepts you have just spent so much time and effort learning.

**Conclusion**

PMP® certification is achievable as long as you start with the end in mind. Certification is the goal, and your study time should be devoted to those concepts that you need to work on. You have to be serious about the process, which means that you will have to devote a couple of hours a day to studying both before your boot camp, and then after your boot camp as you are waiting for your application to be approved and your exam date. Don’t spend more than a minute on any one question. If you cannot figure it out, mark it and come back to it later. You can flag questions for review, and sometimes another question on the exam will jog your memory. Using these tips will get you prepared for your boot camp and will get you ready to pass the first time. Good luck!

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**About the Author**

Dan Stober is a PMP-certified project manager with over ten years of experience managing projects. His experience includes managing projects for the U.S. government in the United States, Middle East, and Europe.