# **Project+ Study Guide**

**PK0-004**



1.0 Project Basics - 36%

### Characteristics of a Project:

| **♦ Temporary - has a defined beginning and end**  **♦ Has a specific purpose to create a result** | **♦ Unique - no two projects are the same  ♦ May be apart of a program or portfolio** |
| --- | --- |

**Operations and Projects are different. An operation, unlike a project, is an ongoing process and repetitive effort. Operations encompass day to day tasks.  
  
Every project has a result. Results can be a product, enhancement, service, improvement of a service, or new asset.**

**The purpose of a project is required for initiation of a project, these include:**

| **♦ Market Demand / Need**  **♦ Business Need** | **♦ Technical Breakthrough  ♦ Request by Customer** | **♦ Legal Requirement** |
| --- | --- | --- |

**Projects require various resources, these can include:**

| **♦ People**  **♦ Units** | **♦ Organizations  ♦ Money** | **♦ Time**  **♦ Knowledge** | **♦ Materials** |
| --- | --- | --- | --- |

**Project management plans are used to manage and maintain a project. Plans are iterative in nature and progressively elaborated as new information is available. Each iteration of the plans will be more detailed and clear to reach project goals.**



**Changing one value in the Project Management Triangle will influence the other two values. This change can be minor to very drastic depending on what changed.**

**For example, if the scope of the project is increased, meaning more requirements are added to the project, then the cost and time of the project will increase based on the change.**

**These 3 values are considered project constraints, and there are typically strict conditions to them.**

| **♦ Time is the amount of time available to complete the project**  **♦ Cost is the budgeted amount available for the project**  **♦ The scope is what must be done to produce the desired project result** |
| --- |

### Project Management Lifecycle:

**Before we address the phases of project management, there are a couple of general factors that apply to all phases.**

**It is important that control is maintained over the project scope and its objectives and activities of the project should align with them. Emphasis should also be placed on the change control process for any changes to the project, including for administrative employees of the company.**

**The project manager is responsible for ensuring that the project addresses stakeholder needs and identifying and planning for risks in a Risk Management Plan.**

**It’s important that all phases of the project include careful planning, realistic and measurable outputs, and transfer / handoff phase.**

**The Project Management Plan should include:**

| **♦ Scope Baseline**  **♦ Risk Management Plan**  **♦ Change Management Plan** | **♦ Project Schedule  ♦ Communication Plan**  **♦ Project Budget** | **♦ Human Resource Plan**  **♦ Procurement Plan**  **♦ Quality Management Plan** |
| --- | --- | --- |

**Initiation Phase:**

**What’s created in this phase:**

| **♦ Project Charter** | **♦ Business Case** | **♦ High-level Scope** | **♦ High-level Risk** | **♦ Core Team** |
| --- | --- | --- | --- | --- |

**The initiation phase of the project is all about understanding what the project is about and where the request is coming from and then defining the basis to build the project management plan on. It’s also ensuring that there is a business case – aka a need – for the project in the first place.**

**Planning Phase:**

**What’s created in this phase:**

| **♦ Schedule** | **♦ Work Breakdown Structure** | **♦ Resources Allocation** | **♦ Detailed risks** | **♦ Core Team** |
| --- | --- | --- | --- | --- |
| **♦ Budget** | **♦ Communication Plan** | **♦ Project Requirements** | **♦ Procurement Plan** | |

**Execution Phase:**

**This is the phase where work is actually being done and the deliverables of the project are created. Objectives and requirements of the project are met during this phase.**

**The Execution Phase starts with the Kick-off Meeting this is a place for introductions between team members takes place and the Project Overview is given. Expectations for the project are laid out and questions can be addressed in a public forum. Stakeholders do not typically attend these meetings, as they are usually for the project team and project manager.**

**↪ Kick-off meetings can occur at the end of other phases but are not required**

**This is also the phase where meeting agendas, meeting minutes, action items, status reports, and dashboards are created. These documents are used throughout the project and are often items distributed out to individuals on the Communication Plan.**

**Monitoring and Controlling Phase:**

**What’s created in this phase:**

| **♦ Risk Log** | **♦ Issue Log** | **♦ Performance Measuring** | **♦ Governance** |
| --- | --- | --- | --- |
| **♦ Budget** | **♦ Quality Assurance** | **♦ Performance Reporting** | **♦ Change Control** |

**Quality and Approval Gates are milestones in the project that, once reached, stakeholders must come out and approve the work presented and see if it is to quality standards. If it is not, the project team must go back and rework the item until it is up to standard.**

**The Monitoring and Controlling Phase is all about making sure that the project is staying as close to the project plan as possible and there is no scope creep in the project. The project is constantly being compared with the baselines determined in the original project plan to see the difference, if any. Monitoring the budget is part of maintaining the scope and project baselines and ensuring that the project is staying on schedule and on budget. The purpose of Change Control is to make sure that all changes made to the original project are approved and do not contribute to scope creep. This is a**

**process that involves making formal change requests that are then approved by an approval authority and then the project team will implement the change.**

**Risk is also being constantly monitored and measured at this stage of the project, risk may happen, and it's important that there is a Risk Management Plan in place to help mitigate risks and provide procedures in case a risk does happen. Issues are things that happened that were not expected or accounted for; these are placed in the Issue Log.**

**Closing Phase:**

**What’s created in this phase:**

| **♦ Transition and Integration** | **♦ Training** | **♦ Project Sign-off** | **♦ Archive Documents** |
| --- | --- | --- | --- |
| **♦ Lessons Learned Doc** | **♦ Release Resources** | **♦ Close Contracts** |  |

**The final phase of the project management lifecycle is responsible for wrapping up all the loose ends of the project and ensuring that stakeholders/customers are happy with the results. Once the project is completed, the deliverables are given to the customer. When the deliverables are passed off, the Transition Plan is initiated and new owners are trained on how to properly use the product. Resources are released from the project and returned to the sponsor if not used.**

**Not all projects end in the same way – there are 4 different possible endings to a project:**

| **♦ Addition: The project is phases into every-day tasks**  **♦ Starvation: The project is canceled and resources are removed**  **♦ Integration: The project is integrated into another project or split up into other active projects**  **♦ Extinction: The project is completed as planned.** |
| --- |

**The project sign-off document is the primary focus of this phase and is prepared by the project manager and approved by the project sponsor.**

**Archival of documents must meet any regulatory requirements as well as any guidance from the Project Management Office (PMO).**

**At the very end of the project, after everything has been completed, it's important that a post-mortem analysis and review takes place in order to form the lessons learned document, which will be archived along with other project documents. This is intended to gather valuable information about the project and provide guidance to future projects.**

**IT Project Management**

**All of these things apply to IT projects. Projects that are related to the IT department are:**

| **♦ Software Development**  **♦ Server / System Deployment** | **♦ Infrastructure Updates  ♦ Automated Systems** | **♦ Datacenter Creation /**  **Improvements** |
| --- | --- | --- |

### Different Roles In the Project:

**In order to have a project you have to have a team of people who will work together to complete the requirements and produce the deliverables.**

**Project Manager:**

**The project manager is responsible for keeping the project on task, organized, and within the defined scope. It is the duty of the project manager to oversee and maintain team communication, project risk, budget and allocated time to avoid scope creep. Additionally, the project manager manages project quality to ensure that deliverables meet quality standards. The project manager is responsible for the project and its deliverables, as well as any artifacts that are produced by the project.**

**Project Sponsor:**

**The project sponsor, also known as the champion, provides and approves the funding for the project, as well as approving the project charter, scope baseline and high-level requirements. The sponsor is also a control authority, meaning that they also have some level of authority over the project alongside the project manager.**

**The project sponsor assists the project manager in dealing with roadblocks and is responsible for marketing the project and the deliverables, and ensures that the business case remains fulfilled throughout the project as well as justifying the case to the project stakeholders.**

**Project Coordinator:**

**The project coordinator is the project manager’s right-hand man. They support the project manager in their administrative duties as well as being responsible for their own set of tasks. They ensure there is cross-functional coordination within the project so the team is properly aligned to meet a common goal. They are responsible for project documentation, allocating time / resources to the project, and checking for quality within the project.**

**Project Scheduler:**

**The project scheduler actually puts together the project schedule, updates it with any changes that arise and communicates these timeline changes to the team. They gather task status from project resources and provides reporting on schedule performance based on amount of time used vs. used time.**

**Stakeholder:**

**The stakeholder is an individual who has vested interest in the project and its deliverables. They provide inputs and requirements, provide expertise, and steer the project in the right direction. Stakeholders do not have any administrative or authority power, they are simply the people that the project is aimed to please. Stakeholders have something to gain or lose by the project.**

**↪ A steering committee may also be in place to help guide the project in the right direction and**

**provide expertise, however they are not a part of every project.**

**Project Team:**

**The project team is the driving force behind the project and are conducting most of the work on the project and contributing their expertise. They also provide time and cost estimates and task dependencies so scope and schedule can be properly estimated.**

**↪ Some work of the project may also be outsourced to a third party – they would provide the**

**the same value to the project as a team member, but are a contractor rather than an employee.**

**Project Management Office:**

**The PMO is an internal or external group that helps to set the guiding principles for projects. They create the performance indicators for work within the project so that quality can be measured. They set the deliverables for each project and provides tools, governance, templates, and standardized documents. They outline what the consequences are for inaction within the project and helps to properly coordinate resources to the project.**

### Project Cost Basics:

**Cost estimation begins in the Planning phase of the project. Estimating the project cost is important to start forming the project budget. The project budget uses the cost baselines to form a number that the project manager believes the project will total based on input from resources and research.**

**Having the estimated cost of the project allows for comparing the planned expense vs. actual expense.**

**There are four ways of estimating the cost:**

| **♦ Bottom Up-Estimating: Every single component estimated and then totalled. This is the most accurate but most time consuming method.**  **♦ Three-Point Estimates: Taking the total average between optimistic, pessimistic, and likely costs. Known as PERT or SME.**  **♦ Parametric Estimating: Known relationship between variables (Unit Cost x Number of Units)**  **♦ Analogous Estimating / Top-Down Estimating: Cost estimated from past similar projects.** |
| --- |

**A contingency reserve is in place to cover the cost of identified risks. This is included within the cost baselines of the budget and are managed by the project manager.**

**A management reserve is to cover unidentified risks and, unlike contingency reserves, are not covered under the baseline. This requires approval from the project sponsor to be used in the project.**

**Earned Value Management (EVM) is a form of expenditure tracking and management to gauge project performance. Performance is tracked and estimated based on planned value, actual cost, and earned value. The burn rate is the rate at which the budget of a project is spent.**

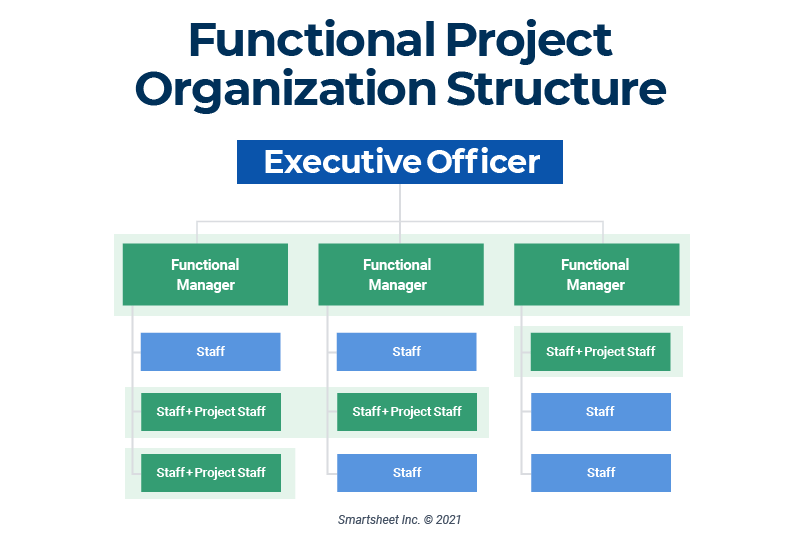
| **♦ Planned Value: The value we should have earned from the project**  **♦ Actual Cost: Amount of money spent to date on the project**  **♦ Earned Value: Value of work actually completed to date on the project.** |
| --- |

**Expenditure Reporting, a part of EVM, provides details on the actual cost, earned value, and invoices throughout the project.**

**Cost Control Equations:**

| **Planned Value (PV) = % of Schedule Completed x Budget** |
| --- |
| **Budget At Completion (BAC) = This is just basically the budget. You see BAC, just think the project**  **budget.** |
| **Earned Value (EV) = % of Actual Complete x Budget**  **↪The budgeted cost of work performed** |
| **Cost Variance (CV) = EV - AC**  **↪Having a positive cost variance means you’re under budget and having a negative cost**  **variance means you’re over budget.** |
| **Schedule Variance (SV) = EV - PV** |
| **Cost Performance Index (CPI) = EV / AC**  **↪ Greater than 1 good; less than 1 bad.** |
| **Schedule Performance Index (SPI) = EV / PV**  **↪ Greater than 1 good; less than 1 bad.** |
| **Estimate at Completion (EAC) = AC + ETC** |
| **Estimate to Complete (ETC): Forecast of how much more money it will take to complete the project.**  **↪ Calculation is out of scope for exam; just learn the definition.** |
| **Variance at Completion (VAC) = BAC - EAC** |
| **CEA/SEP Is an acronym to help you remember the formulas and their order** |

### Organizational Structures:

**There is no set structure of an organization. The organizational structure will determine the amount of authority the project manager will have and if they will have to go through other people to manage the project, or if they have full authority over all resources.** 

**Functional Structure:**

**Functional organization gives the project manager the least amount of authority or control over the project budget. Staff is organized by the department manager and only reports to them, not the PM. This can create major separation in work and the different aspects of the project – effectively creating a silo. Resources are not fully dedicated to the project, and are often part time split between the project and day to day operations.**

**Matrix Structure:  
A matrix organizational structure allows for both the department manager and the project manager to take part in the authority over staff and split the load of management. The kind of matrix structure will determine the level of authority the project manager has compared to the department manager.**

| **Weak Matrix:**  **Weak structure means that the project manager has the least amount of authority and is more a part-time, limited authority that helps to guide the project but not make the vast majority of the decisions while the department manager still has the majority of control. The PM has no control over the project budget.** |
| --- |
| **Balanced Matrix:**  **A balanced structure gives the PM more authority within the project and has equal authority to the department managers. The project manager is more involved in the project, being full time and having access to resources and a mixed control of the project budget.** |
| **Strong Matrix:**  **This is the reverse of the weak matrix organization; the project manager has the majority of the6 authority in the project and full control of the project budget, while the department managers are given a low amount of authority or say in the project and no authority over project budget.** |

**Projectized Matrix:**

**This is an organizational structure that is completely based around projects; there are no departments and all team members are assigned to projects and fully dedicated to them. The project manager has full control over the project, ad hoc resources, and budget of the project.**

**Hybrid:**

**This is exactly what it sounds like; it is a hybrid between one or more of these reporting structures.**

### Developing and Executing Projects:

**In order to develop a project plan and execute it, there are various documents that contribute information and estimates to the project.**

**Project Charter:**

**The charter is the formal authorization that a project can even begin. It gives a description of the project, defines the business need, names the sponsors and project manager of the project. It also includes the high-level timeline, budget, risk assessment, and assumptions / constraints.**

**The formation of the project charter takes into account the statement of work (SOW), business case, contracts, enterprise environmental factors, and organizational process assets.**

| **♦ Statement of Work (SOW): Describes the product / service of the project, the business need, and**  **strategic plan for the project.**  **♦ Business Case: The justification for the project and a cost - benefit analysis.**  **♦ Contracts: If the project is for an external customer and their terms for the project.**  **♦ Enterprise Environmental Factors: Issues that may influence the charter.**  **♦ Organizational Process Assets: Processes, templates, historical data** |
| --- |

**It’s important that during this phase the stakeholder and project manager come to a consensus on the scope of the project to ensure all stakeholders are happy and that no scope creep occurs.**

**Finally, it’s important that the project charter addresses all stakeholder expectations**

**Work Breakdown Structure:**

**A WBS is a decomposition of the scope statement and put in a hierarchical structure without the details of ‘when’ the task will be completed or accounting for every minor detail. It is simply a general breakdown to provide input to the project schedule. It provides a clear picture of what needs to be done and mitigates the risk of missing out on important tasks. It provides a level of transparency and accountability to the project and gives information that can be communicated to the rest of the team.**

**This helps to break down tasks into smaller, easy to manage work packages that give a realistic estimate of time and cost.**

**↪ Rule of thumb is that work packages should be less than 80 hours but greater than 8 hours.**

**The WBS dictionary is a more detailed breakdown of the WBS and is for reference during the project. It includes information about:**

| **♦ Resources Required**  **♦ Acceptance Criteria** | **♦ Cost Estimations  ♦ Contract of Information** | **♦ Quality Requirements**  **♦ Responsible Individuals** |
| --- | --- | --- |

**The WBS is a necessary component of project planning and provides information for estimating cost, schedule, activity definitions, resource planning, and in building the Risk Management Plan.**

**The WBS can be created through the following methods:**

| **♦ Top-Down: General to specific breakdown**  **♦ Analogous: Similar to other projects and built**  **off historical data** | **♦ Bottom-Up: Specific to general breakdown  ♦ Guidelines: Broken down based on organizational processes** |
| --- | --- |

**The WBS is iterative! It can go through many changes before it is final and fits the project perfectly.**

**Project Budget:**

**The total estimated cost of the project after all planned factors have been accounted for.**

**Project Schedule:**

**The schedule is intended to define the key dates of the project and identify the resource requirements for each task. Developing the key dates and understanding their durations allows the critical path of the project to be calculated – the critical path is the path of most importance in the project and is the longest path in the project. The schedule is intended to coordinate activities and resources, while ensuring that no activities are completed in a conflicting manner. It provides the schedule baseline.**

**Creating the schedule involves the WBS, task time estimates provided by the staff, resource assignments and task dependencies. This schedule will be iterated upon in the planning phase and throughout the project as risks are executed.**

**The broken down work packages from the WBS are used as a way to map tasks together and properly schedule. It’s based on the resource calendar and used to identify existing resource availability. It is also used as a method of assessing skills of the team and identifying if there is a need for training or outsourcing resources of the project. By understanding what resources are available, these can help define the schedule of the project, and make sure the critical resources are assigned to the proper resources. Using a resource breakdown structure can help with this assignment process.**

**Network diagramming, also known as the precedence diagram method (PDM), places each activity in a node and then orders them in order of predecessors and successors.**

**The arrow diagram method (ADM), also known as activity on arrow (AOA), displays tasks in a Finish to Start dependency, and the length of the arrows defines how long a task is.**

**Dependencies:**

| **♦ Finish to Start: Task B doesn’t start until task A**  **completes**  **♦ FInish to Finish: Task B doesn’t finish before**  **Task A is finished** | **♦ Start to Start: Task B doesn’t start before Task A**  **starts.  ♦ Start to Finish: Task B doesn’t finish before Task A**  **starts.** |
| --- | --- |

**As stated previously, the critical path is the path of tasks that has the longest duration.**

**Float is the duration of time between activities that can occur without affecting the finish date of the project. Forward pass float is working from beginning to end, and the backward pass float is working from end to beginning. Forward pass is composed of Early Start and Early Finish; Early Start is the earliest a task can be started and Early Finish is the earliest the task can be completed. Backward pass is the reverse of this with Late Start and Late Finish.**

**Compression methods are used to speed up the progress of a task(s) to account for a recent delay in schedule. Crashing adds more resources to the critical path so work can be completed faster. Fast tracking is doing tasks simultaneously to speed up the overall project. Fast tracking increases the risk.**

**Milestones are significant project events. They have no duration, however they can spark the start of a quality checkpoint or approval checkpoint for the project.**

**A schedule baseline is the final approved schedule and is used to monitor the progress of the project. Changes cannot be easily made to the schedule beyond this point and must go through the change management process.**

### Agile / SCRUM Methodology:

**This is a method of breaking down projects into small chunks that are constantly iterated upon through inspecting and then adapting based on the situation. There is constant collection of requirements and feedback to ensure that the project stays on track. This is best used in a project environment that is unpredictable in nature.**

**SCRUM Roles:**

| **♦ Product Owner: Has the idea for the project and controls the product backlog – a prioritized list of**  **work that needs to be completed on the project.**  **♦ Development Team: Consists of 3-9 people who work together in a cross-functional manner to complete the tasks of the project. Everyone will have various skills to help complete objectives. It is self organized, meaning no person directs the process of making the product backlog into increments. The team as a whole also bears full responsibility for the project.**  **♦ ScrumMaster: The ScrumMaster helps to facilitate the project and enforce the principles of the Scrum methodology, but has no real authority over the project, as all weight is placed on the development team. They are also there to help the team remove roadblocks if they arise.** |
| --- |

**SCRUM Events:**

| **♦ Sprint Planning: Creation of the Sprint Backlog; this contains a list of all the things to be done on**  **the project.**  **♦ Sprint Execution: Actually completing work on the Sprint Backlog. The tasks of designing, building, integrating, and testing items into increments is conducted during this phase.**  **♦ Daily Scrum: A daily meeting held to discuss status, issues, and remediation.**  **♦ Sprint Review: Stakeholders and team members come together to review completed work.**  **♦ Sprint Retrospective: This is the phase of writing lessons learned from the project.** |
| --- |

### Importance of Management:

**There are various things within a project that need to be managed to maintain proper control, such as human resources, physical resources, and personnel. Management also refers to the management of communication and resolving conflicts that arise between the team members.**

**In order to understand resource management, it’s important to understand the different kinds of resources available: shared resources and dedicated resources. A shared resource is one that is a part-time worker on your project and has other duties of work unrelated to the project; their time is shared between day-to-day operations and project objectives. This could also be a tool or software that is used both for the project and daily operations. The project manager does not have full control over a shared resource, and often has to work with a functional manager about scheduling their time for the project. Dedicated resources are directed entirely to work on the project, and no energy is directed elsewhere. The project manager has full control over a dedicated resource, as they are not doing any other job and only work for the project.**

**Resource allocation, also known as resource scheduling, is assigning available resources to tasks.**

**Overallocation of resources can result if resources are over-booked on projects, which prevents productive work from being completed. If the scope of the project changes, allocation will be affected.**

**A resource shortage is when there are not enough resources to allocate to the project, and tasks go without resources or not enough resources; a shortage can cause overallocation. There’s also a possibility to get low-quality resources, which are resources that do not have the proper skills to complete the task, or are people that are unfavorable to work with and cause conflicts with the project team.**

**A benched resource is a resource that has finished the project / their task on the project, but have not been assigned to a new project to work on.**

**It's important to understand the interproject aspects as well, such as dependencies and resource contention. Interproject dependencies occur when a project is part of a program, and a deliverable from another project is required to complete a task. This opens the possibility that if one project is delayed, every project in the program could also be delayed as a result.**

**↪ A program is a collection of projects that are managed as a group**

**Interproject resource contention is like overallocation, and requires that project managers coordinate the resource properly so that the resource is available when each project needs them.**

**The project manager is responsible for molding the project team, a temporary group of people working to deliver the project on time. Team members must be equipped with the skills needed to complete tasks, and may be composed on in-house or outsourced members. Team members can also be full time or part-time, and be remote or on-sight. Typically, for the best collaboration between team members, it’s preferred that resources are collocated; meaning that all team members are brought to the same geographical location.**

**↪ The project manager doesn’t always have full authority of building the project team,**

**sometimes the team is completely built by functional managers, or other times the project manager has to request the resource from the functional manager for the project**

**A project organization chart is used to lay out the project team in a hierarchical manner to understand who reports to who and what position an individual is.**

**Similarly, you can use an organization breakdown structure (OBS), which breaks down the departments, work units or teams within the organization into their respective work packages.**

**Resource breakdown structure (RBS) is a chart that breaks down the work of the project according to resources needed in a hierarchical structure.**

**A responsibility assignment matrix (RAM) is a chart that maps the WBS elements to resources.**

**A chart similar to the RAM is the RACI chart, only instead of mapping the WBS element to the resource, the resource is assigned to an element with responsibility, accountability, consulted, and/or informed to show what that resource is responsible for.**

**It’s also important to have a roles and responsibilities document, which lists the individual or group’s responsibilities in the project, not just their tasks**

**Team building is a set of activities or methods that are used to design a group of people to work together effectively for an objective A team building model produced by Bruce Tuckman breaks down the building process into forming, storming, norming, performing, and adjourning.**

**Forming: bringing the team together and introduced to each other and the project objectives**

**Storming: team members fighting for a position within the project.**

**Norming: team knows each other by this point and their position in the team is established.**

**Decisions are being made jointly and team members have respect for each other.**

**Performing: point of success, productivity, and effectiveness occur if the team reaches this**

**point. There's a high level of trust between team members.**

**Adjourning: breaking up of the team once the project is completed and resources are returned.**

**It’s during the Forming and Storming phases that trust building begins; trust is very important to build within the project team. Teams that trust each other are more comfortable sharing ideas and disagreeing with the team. These teams also tend to be more successful than teams that do not build trust.**

**There may be team members that also need training to perform activities to the standards of the project or to better follow organization or industry standards.**

**Teams should know what things indicate performance and quality for tasks. Things like this can include:**

**♦ Specifying performance expectations**

**♦ Identifying inadequate performance behaviors**

**♦ Rewarding superior performance**

**♦ Reprimanding inadequate performance**

**Conflict can arise between team members; this could be because of conflicting ideas of goals for the project or because of communication issues. There are several methods used to resolve conflict, these include the following:**

**♦ Smoothing: Temporary resolve, makes the conflict be less important or noticeable. Buys time.**

**♦ Forcing: Forcing a solution onto a party. Permanent but does not mean it is a ‘happy’ solution.**

**Considered a last resort.**

**♦ Compromising: Working with both parties to find a solution. Neither side wins or loses. Can be**

**permanent.**

**♦ Confronting: Best solution to conflict, problem-solving method that breaks down the facts of**

**the problem, leading to the single right solution to the conflict, win-win technique.**

**♦ Avoiding: Never results in resolution, complete avoidance from either one or both parties.**

**♦ Negotiating: Involved both parties talking through the conflict and coming to a conclusion.**

**May involve an additional third party to talk through with the two parties. Could be a win-win, win-lose, or lose-lose, depending on the situation.**



2.0 Project Constraints - 17%

### Common Constraints:

**Constraints are the limitations that dictate the project and its execution.**

**♦ Budget: is always a constraint in a project. The budget is established in the planning phase as**

**the cost baseline.**

**♦ Scope: is a limitation on what will be completed in the project and used to avoid wasted time,**

**requirements directly play into scope and deliverables.**

**♦ Time: a constraint on the time available for an activity and it will be completed. Is**

**influenced by the scope and budget.**

**♦ Quality: based on parameters defined by the stakeholders / PMO and monitored throughout**

**the project. These are things that must be met for the project to be successful.**

**♦ Resources: there isn’t an unlimited number of resources or things that a single resource can**

**do. Resources are limited, and a resource can only be used so much before it is**

**overallocated.**

**♦ Environment: things like weather, regulations, politics, and market conditions can be a**

**constraint on the project as well.**

**Budget, scope and time are the three biggest constraints in a project, and if one of these constraints is changed, the other two will also change. This is known as the ‘Big Three’ or a triple constraint.**

**The project management diamond adds in Quality to the Big Three.**

**The project management star adds risk and resources to the diagram.**

**There can be influence on constraints of the project, such as change requests which can have an affect on time, budget and cost of the project. Scope creep is the result of uncontrolled changes to the project, which can have a major impact on the constraints.**

**Constraints in the project can have different priorities; for example, completing the project as quickly as possible can be the priority of the project, so all other constraints will have to be built around and adjusted to the priority.**

**Stakeholders, sponsors and management can also be a factor on constraints; their goals and wants can change, which means project priorities can change as well. People may also lose interest in the project or a new project may be created and change the objective of the current project or require it’s resources.**

### Risk Strategies and Activities:

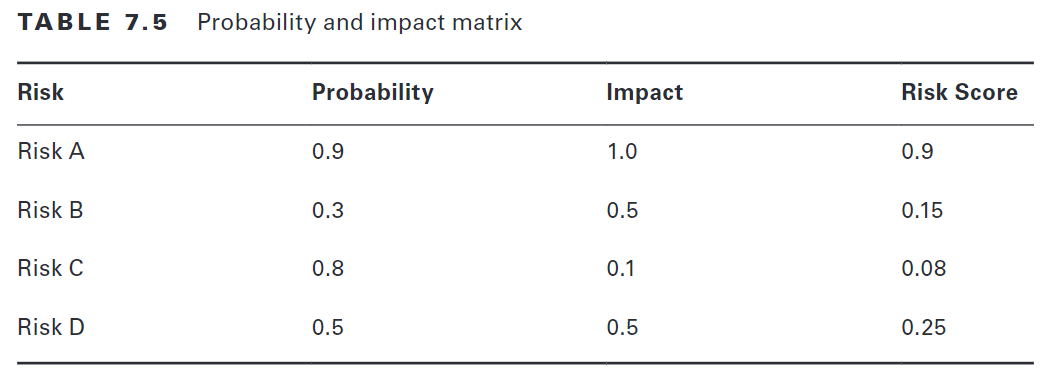
**Risk is the potential for an event to happen, with a possible negative or positive outcome. It’s important that risks are planned for and plans for risk mitigation are in place, as well as thorough understanding of risk activities.**

**Activites:**

**Risk analysis determines the likeliness of a risk occurring and how heavy of an impact they will have on the project. This is done by creating a probability and impact matrix, where each risk is listed and the probability of the risk is listed on a rating between 0.0 and 1.0 – 0.0 being no likelihood and 1.0 being the guaranteed likelihood. Historical data and expert input is the best way to determine the probability of a risk.**

**↪ Understanding the risk tolerance of stakeholders is important for determining how much a**

**risk will impact the project.**



**Risk impact is rated either low, medium or high based on the severity of the risk and how much tolerance stakeholders have to that risk. Impact follows the same matrix of being on a 0.0 - 1.0 scale. Low being 0.0, medium being 0.5, and high being 1.0.**

**The risk score is calculated by multiplying the probability by the impact.**

**Risk response planning is creating a planned response for the risks with the highest scores and what actions should be taken, if any, if a risk is executed. Keep in mind, not all risks are negative risks**

**Strategies:**

**There are 7 strategies that can be used to address risk:**

**♦ Accept: this is when you do not do anything with the executed risk and accept whatever**

**consequences result. Based on the risk and impact, it is accepted because it likely does not have major impact**

**♦ Mitigate: This is reducing the probability and the impact of the risk from occurring.**

**♦ Transfer: Transferring the liability of the risk to another party, such as an insurance company or an outsourced specialist.**

**♦ Avoid: Stopping the probability of the risk occurring at all**

**♦ Exploit: Taking advantage of a positive risk**

**♦ Share: Sharing the opportunity with a partner who can better take advantage / exploit it**

**♦ Enhance: Increasing the probability of opportunities executing in the project.**



3.0 Communication and Change Management - 26%

### Methods of Communication:

**Meetings are the most common form of communication, and are typically a form of communication that holds the most important information about a project.**

**♦ Kick-off Meetings: Occurs as the official ‘start’ of the Execution phase and are used for**

**introductions and setting the expectations and goals for the project.**

**♦ Scheduled Meetings: Planned in advance and may be reoccurring throughout the duration of**

**the project, such as the daily Scrum meeting.**

**♦ Impromptu Meetings: Not scheduled and may happen spontaneously.**

**♦ Virtual Meetings: Meetings that take place over a virtual meeting application such as Zoom.**

**Staff may be separated geographically or work off-site. Virtual meetings allows for all parties to participate, even if they are not in the same location.**

**♦ In-Person Meetings: Takes place in a physical location where all staff must travel to. Typically**

**better for interaction between team members, but can be difficult if not impossible if there are team members that are not in close proximity to the meeting location.**

**♦ Closure meetings: At the end of the project, talks about lessons learned; what worked and what**

**didn’t work in the project.**

**Meetings are not the only form of communication however. Other methods of communication include:**

**♦ Emails: A fast and efficient way of communicating things like meeting agendas or minutes.**

**This is not something that can be used in place of a normal meeting in most cases, but for**

**basic information or recaps, it is more than sufficient.**

**♦ Fax: Really only used for sending documents, but is outdated and email is usually used in its**

**place.**

**♦ Instant Messaging (IM): Good for quick messages to the team and having many conversations**

**at once. However it's not a formal form of communication and is not suitable for complex information.**

**♦ Video / Voice Conferencing: Good if staff is geographically separated and as a replacement**

**for in-person meetings, it however requires technical equipment to conduct.**

**♦ Face-to-Face: While not always possible if staff is not geographically together, face-to-face**

**meetings are the best way for dealing with conflict and building relationships between staff members.**

**♦ Text Messaging (SMS): Good for when phone calls are not viable or if someone needs to be**

**quickly notified, however information can be misunderstood and it is not good for complex conversations.**

**♦ Printed Media: Can be useful for some documents but its very labor intensive to maintain.**

**♦ Social Media: Great at building a community between peers and encourages interaction**

**between people. However, it is something that needs to be monitored by upper management**

### Influences on Communication:

**Communication can always have its issues. It could be because of language barriers or cultural differences, but it could also be simply that two people do not get along with each other. Everyone is different, and no way of communication can be perfect for every scenario. Things can get lost or be influenced by other factors that the team may have to adapt to or adjust their way of communicating to accommodate.**

**♦ Language Barriers: Can cause miscommunications or misunderstandings, requires effort to**

**ensure parties understand.**

**♦ Cultural Differences: Can result in different levels of formality or behavior, requires people to**

**be respectful and understanding.**

**♦ Timezone & Geographical Factors: Can make meeting times difficult, requires the use of video**

**conferencing in majority of cases.**

**♦ Technological Factors: Technology can be unresponsive at times, so there needs to be**

**understanding for when these devices are not responsive or limit communication**

**♦ Interorganizational Differences: This may show up in a hierarchical organization where people**

**may behave differently due to many people being involved in their career and performance**

**evaluation.**

**♦ Intraorganizational Differences: These are things that the organization may do internally that**

**works for them, even if it may not be standard practice.**

**♦ Personal Preferences: People can have different preferences for ways they want to**

**communicate with people.**

**There are often reasons for different forms of meeting to occur, such as being due to the content of the information or if the information needs to be addressed as soon as possible. Sensitive issues are typically best addressed in a face-to-face meeting, such as addressing a conflict. If information is heavily detailed, written communication may be better to use, or be used in conjunction with other forms of communication. Urgent communication should be addressed in a timely manner, so things like impromptu meetings, phone calls, SMS / IM messaging, etc, are more sufficient to use than something like email. Email could however be used for something like weekly recap emails or weekly agendas.**

**Stakeholders also may have specific requirements for communication - this is noted in the Communication Plan of the project. An active stakeholder would receive weekly communication about the project, where a less active stakeholder may get updates every few weeks or once a month. Depending on the stakeholder, they may want a high-level update, or a detailed report, and the report may vary in the information it presents to suit the stakeholder; these will typically use a template to maintain consistency. Form of communication with stakeholders can vary due to personal preferences as well as how involved the stakeholder is with the project. Communication should be tailored to the stakeholder, their personality, priorities, etc.**

**Confidentiality is also an important factor that needs to be considered during communication. This means being mindful of what is put into emails and who is on the receiving end, keeping in mind security regulations, and keeping track of if stakeholders have differing levels of confidentiality.**

**It’s also important to build rapport with stakeholders to better communicate and understand their feelings. This is done through events and activities, and have a facilitated environment to do so.**

### Communication Triggers:

**Triggers are events that take place that initiates the need to communicate with stakeholders and other individuals involved with the project.**

**♦ Audits: These are checks to ensure that deliverables are meeting business requirements and**

**proper procedures are being followed. It’s also used to ensure that the earned value justifies the cost.**

**♦ Project Planning: The planning phase requires a lot of communication with various parties.**

**♦ Project Change: Any time there is a change to project plans, there needs to be proper**

**communication to the stakeholders and staff working on the project.**

**♦ Risk Register Updates: Risks that occur or are identified need to be relayed to the**

**stakeholders.**

**♦ Milestones: A trigger for communicating good news to all parties about the progress of the**

**project.**

**♦ Schedule Changes: Schedule changes need to be communicated to all parties involved due to**

**their level of importance in the project, and the fact that stakeholders will be looking to these dates for results.**

**♦ Task Initiation / Completion: More team-level communication to praise employees for good**

**work and coordinate starting tasks.**

**♦ Stakeholder Change: Stakeholders have to do through the same change control process as**

**anyone else, however sometimes stakeholders feel that due to their position they can make any**

**changes they want. This may require communicating with other stakeholders or the project sponsor to explain the need for proper change control.**

**♦ Gate Reviews: Predetermined checkpoints in the project to approve the quality of deliverables.**

**♦ Continuity Response: The business continuity response is how the business will continue to**

**operate in case of a disaster, and if these situations were to occur, then communication would follow.**

**♦ Incident Response: Coordinated response for specific disaster events and how the team will**

**respond.**

**♦ Resource Changes: In the case of resource changes, there needs to be communication about**

**this, sometimes a meeting if the resource change is significant enough. A resource change can impact many factors of the project such as schedule and budget.**

### Change Control Process:

**The change control process is used as a way to receive requests for changes and then evaluate their impact on the project and its scope before implementation. It ensures that there is no scope creep and all changes made to the project are accounted for and not found suddenly during the review process.**

**Identify:**

**At this point, a change request form is used, received, and documented. As soon as the request is submitted, it is given an identifying number and recorded in the request log. A request form is a template document that the requester must fill out with their request and its purpose.**

**Evaluate:**

**Once the request is received and documented, it is then evaluated by experts in the field and by the PM to determine if the change benefits the project and how it affects the constraints, and does the value it provides outweigh any changes to the constraints of the project. It’s also important to consider at this point a regression plan for if the change does not work out and how the team will reverse the changes. This may also be called a roll-back plan.**

**Approval:**

**The request is then presented to the change control board, a group of individuals who determine the need and justification for the change, and will approve, deny, or defer the change. These individuals are often stakeholders that hold different places of interest in the project, so decisions can be made accordingly. The decision of the board is noted down on the request log.**

**↪ In the case of an emergency change, procedures are usually altered to best address**

**these kinds of requests, such as allowing a bypass of the change request process.**

**Implementation:**

**This is the implementation of the approved change and doing whatever implementing that change entails. Making a change like this introduces a new set of possible risks as well, which need to be added to the risk register, logged and planned for.**

**Validate:**

**Once the change is implemented, a validation phase occurs to ensure that the change was made accurately to the request. If the change does not work as intended, then the regression plan will be initiated.**

**Updating:**

**Once validated, affected project documents are then updated according to the change. It’s important to make sure that there is proper versioning of documents when changes are made to documentation.**

**Communication:**

**Finally, the changes made should be included into the communication plan so all stakeholders are aware of the changes made to the project.**

**This process is used for any change that occurs during the project. There are, of course, common changes that may occur in the project:**

| **♦ Timeline Change**  **♦ Quality Change** | **♦ Funding Change  ♦ Resource Change** | **♦ Risk Event**  **♦ Scope Change** | **♦ Requirements**  **Change** |
| --- | --- | --- | --- |

### Types of Organizational Change:

**Organizational change can have a significant impact on a project; it could result in delays, fast tracking, or complete abolishment of the project altogether.**

**♦ Business Merger / Acquisition: One business buys another in an acquisition and these may or**

**may not merge as a result of the purchase.**

**♦ Business Demerger / Split: An organization breaks up into separate business units.**

**♦ Business Process Change: Changing the way operations are conducted.**

**♦ Internal Reorganization: Changing roles and reporting within the organization.**

**♦ Relocation: Moving working location.**

**♦ Outsourcing: Using a third party to conduct a task or operation within the organization.**



4.0 Project Tools & Documentation - 21%

### Project Management Tools:

**There are various tools that are used throughout the project management process to make things easier and more efficient.**

**Project scheduling software is a tool that can automate the estimation process for task durations, create the critical path, and make resource allocation an easier process. It can help with building gantt charts or display customized information for a particular stakeholder.**

**Charts are used as a way to display information, break down information, or provide a process breakdown.**

**♦ Scatter: Plots data on a graph to determine if the data factors correlate with each other.**

**♦ Histogram: Displays the frequency distribution of variable data.**

**♦ Run Chart: A display of data and its changes over time as plotted points on a graph**

**connected with a line.**

**♦ Poreto: A bar and line graph that displays the values as bars and cumulative total by a line.**

**♦ Fishbone: This is a cause-and-effect diagram that is used to help identify the root cause of an**

**issue or set of issues. Also called the Ishikawa diagram.**

**♦ Flowchart: Also called a process diagram, breaks down the process into a ‘yes’ or ‘no’ format**

**and provides a ‘next step’ for the response.**

**♦ Gantt Chart: Breakdown of the task timeline of a project and illustrates the critical path.**

**Status reports are written documentation of project progress. These reports are used in conjunction with the Communication Plan to give recipients updates on progress.**

**Dashboards are a visual representation of the status report and show different charts, tables, logs and reports on the project.**

**Intranet sites are used solely by the internal organization as a knowledge base and for storing documentation.**

**Internet sites are open to the public and anyone can use them. These are good for research and gathering information about a topic.**

**Wiki pages allow anyone to edit them or add information, which means that these sites must have proper management of information and cross checked to ensure that information is accurate.**

**Vendor knowledge bases are exactly what they sound like; a knowledge base provided by a vendor to be used as an informational resource.**

**Collaboration tools allow for multiple employees to work together on a project.**

**There are various tools used to measure performance, track deviation from the project plan, and compare results with other projects. Key performance indicators (KPIs) are a measurable value to determine performance, and key performance parameters (KPPs) is a similar metric used by the DoD to measure performance on operational goals.**

**A balanced scorecard is a visual indicator that shows performance based on business goals. This could be based on financial performance, process innovation, etc.**

**SWOT Analysis**

**The identification phase tries to identify and document the possible risks of the project. It goes through the strengths, weaknesses, threats and opportunities of the project by talking to experts and doing a SWOT analysis. There are common risks with a project, such as funding / budget, schedule, scope, hardware, management risks, among others. All identified risks are placed in the risk register, which names the risk, its identification number, description, owner, and the risk response plan.**

**Addressing the strengths and weaknesses of the organization is the first step of SWOT analysis. This shows the areas where the organization is strong and has less chance of risks, and where they are weak and have a higher chance of risk. Opportunities and threats are external factors that can be a risk to the project, such as weather changes or financial markets.**

**As mentioned previously, a RACI matrix is a chart that breaks down tasks and who is responsible for what aspect of the task. A person can be labeled one or more of the following:**

**♦ Responsible: Does the work of the task.**

**♦ Accountable: Approves the work and is responsible for ensuring that it is done correctly.**

**♦ Consulted: Provides information to help those responsible for the task.**

**♦ Informed: Needs to be kept informed about this task.**

### Project Centric Documentation:

**Project charter is formed during the initiation phase of the project.**

**The project management plan is a collection of many plans put together that will be used during the project management process. The project management plan will include:**

**Scope Baseline**

**The scope baseline is the approved project scope, which is documented in the scope statement.**

**Project Schedule**

**Defines start and completion dates for tasks on the project and helps with resource allocation.**

**Human Resource Plan**

**Iterative process plan of managing the human resources within the organization to get the most out of their skills and knowledge.**

**Risk Management Plan**

**The documented potential risks to the organization and the steps that the organization will take to keep those risks at acceptable levels – aka mitigation.**

**Communication Plan**

**A document that defines all individuals that need to be informed about the progress of the project and the level of information the individuals want.**

**Procurement Plan**

**Not every project has this, but it is a document that identifies the goods or services that will need to be purchased for the project – external resources that will be needed for the project.**

**Project Budget**

**The total estimated cost of the project after all planned factors have been accounted for.**

**Change Management Plan**

**The documented plan of how changes requests are received, documented, approved, implemented, reviewed and communicated to stakeholders.**

**Organizational Chart**

**A visual breakdown of all members of the project team, their role, and their ‘status level’ on the team.**

**The issue log is used to record risks or events that have happened that were not expected when going through the risk management process.**

**As stated before, status reports are written documentation of the progress of the project. Dashboards are a way of displaying the status report of the project in a visual way with charts, breakdowns, etc.**

**A meeting agenda is the written plan of the meeting before it occurs to give participants an outline of what things need to be addressed in that meeting; helps with keeping on task and being productive. Meeting minutes are the meeting notes / recap of what was discussed, what conclusions were made, and what the next steps are for action items of the project. Action items are the tasks that need to be completed.**

### Partner / Vendor Centric Documentation:

**When selecting vendors or partners for a project, there are a series of helpful documents that can provide information to an organization so they can better determine who is the right fit for their needs.**

**A request for information (RFI) is used to gather more information about the goods or services. This gives an idea of if the company can complete the work and how much the work will cost.**

**A request for quotation (RFQ) is similar to an RFI but is more focused on the cost of the service than it is about informing the customer. FPC = Fixed Price Contract**

**A request for proposal (RFP) is the solicitation for bids on a project. The project is described and opened up for bidders to come forward with an offer to the company.**

**A non-disclosure agreement (NDA) is a contract between two parties that enforces confidentiality of information shared.**

**A cease and desist (C&D) letter is a warning document sent to an individual or company to demand that allegedly illegal activity stop.**

**A letter of intent (LOI) document is the outline of what deal has been made and finalizes the agreement between two parties – however, it is not a ‘legal agreement’, it is more of a final agreement confirmation.**

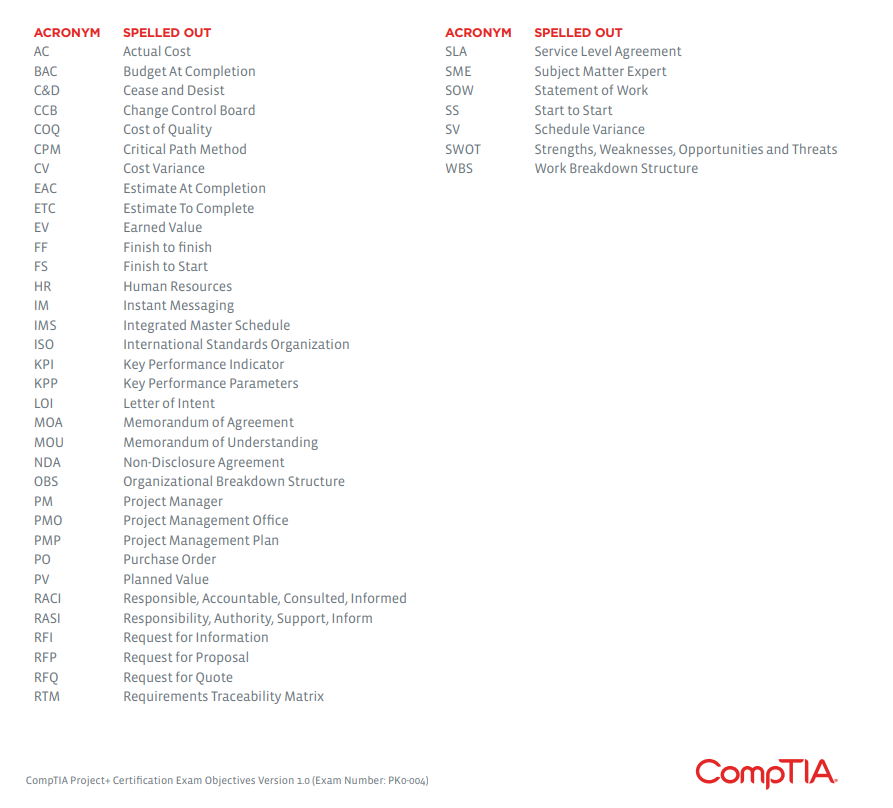
**A memorandum of understanding (MOU) is a mutual agreement between two parties about the terms of a contract. It is not legally binding, but is considered a starting point for negotiations.**

**A purchase order is the first official document indicating the products, amount, and agreed prices that a buyer wants from the seller.**

**A warranty is a written guarantee to the customer that a product or service will be replaced by the seller if it meets the criteria within a specific time frame.**



Acronyms

****



Extra Resources / Notes

### Things to Keep in Mind for Exam:

**♦ According to the Certification Guide by J. Ashley Hunt, the Project+ exam assumes a strong matrix organization unless stated otherwise! This means there are core resources for the project and the team must be acquired for executing work.**

**♦ Answer questions *based on the textbook answer.* Some answers may not feel correct based on what you would do or based on your understanding of the information, however you should always answer with how CompTIA has based their methods on.**

**♦ Don’t second guess, just answer.**

### Class Experience Overall / Recommendations:

**This is easily the hardest exam I’ve taken thus far with WGU. I have a very technical background and almost no real experience in project management. This exam took me 3 attempts, and this document was created during the prep for my third, passing attempt. I made this document not only for my own sake, but also for anyone else who is struggling with this class, as the course chatter talked a lot about this being a multi-attempt course for many people. In total I spent 2 months on this course, when my average is 2-3 weeks for certification courses.**

**Use the CyberVista practice tests! Honestly I think I can attribute much of my success to these tests, both to get a feel for the actual exam and also editing these notes to be more in depth in areas that felt lacking. Also too, I recommend doing some of** [**the exam dumps from this website**](https://www.dumpscollection.net/dumps/PK0-004/)**. There are many questions from these dumps that are very similar to things you’ll see on the exams and is definitely a good resource to use in preparing for this exam. I can’t recommend practice tests enough for this class. You *have* to learn how to apply knowledge to real world situations and not get confused with CompTIA’s wording of the questions. They will try to trick you. Please read the questions multiple times and break it down as much as you can before attempting to answer.**

**Personally, I wouldn’t bother with using the Pluralsight video learning path - it’s very vague and will not at all prepare you for the detailed aspects of this exam. It’s very surface level knowledge. The** [**Udemy course**](https://www.udemy.com/course/comptiaproject-pk0-004/) **is a much better use of your time I feel like. Keep in mind that WGU students have free access to udemy! Log in through the organization option, search the course and you’ll be able to enroll. As mentioned in my recommendations however, the CyberVista platform is amazing for practice tests and practicing areas of weakness. I would print out a 30-40 question test to practice every evening and grade myself afterwards. Any questions I got wrong I would read the explanations for and update my notes as much as possible. This I believe is what helped me the most out of any resource I’ve used.**

**The CertMaster modules I used more to confirm my knowledge of topics. You can take the short tests that address each area of the exam and get explanations that way as well, similar to CyberVista. However, I found these tests to be not as detailed or similar to the exam questions. Use them, but don’t take them as everything you use. These tests can make you feel very confident about taking this exam, but that confidence will be in shambles as soon as you sit down for the exam, as the questions are nothing like the actual exam questions and only share the same topic or surface level knowledge of a question.**

**The actual test is a long haul. Normally I finish tests with 20 or so minutes extra, but all three of my attempts with this exam I was down to the last 5 minutes while submitting. Use your time wisely! Concentration can be hard to maintain with this exam due to the questions, and I’d recommend taking this test in the morning when your brain is on high alert.**

**Learn your processes! There’s multiple topics in this exam that involve set steps and processes to follow, and they quiz you very hard on them. In all three attempts of my exam, this was probably the most common kind of question I got.**