PM Notebook

Summarizing Project Management Concepts for the PMP Exam

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Road to PMP

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No great man ever complains of want of opportunity.
Ralph Waldo Emerson

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CHAPTER 4 – INTEGRATION MANAGEMENT

Key Terms

Integration – Keeping everybody working towards the same goals and dealing with changes.

Integration Types

Process-Level Integration – pre-defined actions will bring pre-defined results and that process areas are integrated, meaning that what you do in one knowledge area affects other knowledge areas.
Cognitive-Level Integration – Experience and maturity, leadership, and mastery of PM.
Context-Level Integration – the idea that the ways projects are managed have changed or evolved as times have changed, with technology being a prime example.

Changes, Defects, and Corrections

Defect – Something faulty or erroneous in an item, procedure, component, or deliverable. In other words, any deliverable that is not meeting its requirements.
Defect Repair (Rework) – When a component of the project does not meet specifications.
Corrective Action – Any action taken to bring expected future project performance in line with the project management plan.
Preventive Action – Steps that you take to avoid anticipated or potential problems or deviations.

Processes

1 – Develop Project Charter (Initiating)

- A statement of objectives and milestones of a project.
- **Usually** it is the **responsibility of project initiator, sponsor,** or even **portfolio steering committee**. **Sometimes, the project manager creates it, and the sponsor approves it**.
- Must be developed for all projects and for each phase.
- Must be broad enough so it does not need to change as the project progresses.
- Any change to the project charter should call into question whether project should continue.
- If the project is in progress and no project charter has been developed, you must continue on the project without developing the charter as the project is already existed.
- It sets out –
  - High-level goals and requirements
  - Main stakeholders and sponsors

- Level of authorization of PM
- Links the project to the strategic plan and ongoing work of the organization.
- Summary milestone schedule
- Overall project risk
- Responsibilities
- Measurable project objectives
- Success criteria
- Preapproved financial resources
- Pre-assigned resources
- Approval requirements
- High-level assumptions and constraints
- Exit criteria

Inputs

1. **Contracts/Agreements –** What you agreed to do like SLAs and vendor contracts.
2. **Business Documents**
   - **Business Case**
   - **Benefits Management Plan**
3. **Statement of Work (SOW)**
4. **Enterprise Environmental Factors (EEFs)**
5. **Organizational Process Assets (OPAs)**
   - **Monitoring and Reporting Methods**

Tools

1. **Expert Judgment**
2. **Data Gathering Techniques**
   - **Facilitation Techniques**
3. **Interpersonal/Team/Soft Skills**
4. **Meetings**

Outputs

1. **Project Charter**
2. **Assumptions Log –** List of **constraints and things** that you believe to be true or false. Assumptions that prove wrong can become risks for the project.
   - All identified assumptions must be recorded, analyzed, and tested.
   - High-level strategic and operational assumptions are documents in business case.

2 – Develop Project Management Plan (Planning)

- A formal approved document used to manage project execution.
- It defines how the project is executed, monitored and controlled. It also defines **baselines**.
- Broken into **subsidiary plans** each dedicated to a knowledge area.
- **After baseline, change control is required** to update the plan.
- **Participants** in creating the management plan are **project manager, team members, customers, and management.**
- Requires **formal approval from sponsor or key stakeholders**.

- Contents of project management plan is primarily influenced by the **application area** and **complexity of project.**
- **Kick-off meeting –**
    - Happens **after the plan is approved, and at the beginning of each phase.**
    - Establishes **working relationships** and standard format for global communication.
    - **Reviewing** project plans.
    - Establishing individual and group responsibilities and accountabilities.

Inputs

1. **Project Charter**
2. **Outputs of the other planning processes**
3. **Enterprise Environmental Factors (EEFs)**
4. **Organizational Process Assets (OPAs)**

Tools

1. **Expert Judgment**
2. **Data Gathering Techniques**
3. **Interpersonal/Team/Soft Skills**
4. **Meetings**

Outputs

1. **Project Management Plan**
    - **Project management processes** that will be used on the project and the details degree.
    - **Knowledge area management plans** – Scope, Schedule, Cost, Quality, Resources, Communications, Risk, Procurements, and Stakeholder.
    - **Performance Measurement Baselines (PMB) –** integrated scope-cost-schedule plan for the project to measure and manage performance.
    - **Change Management Plan**
    - **Configuration Management Plan**
    - **Benefits Management Plan**
    - **Project Lifecycle (Phases)**

3 – Direct and Manage Project Work (Executing)

- Provide overall management of the project work.
- Implement approved changes.
- Lead and perform activities in the project management plan.
- Perform activities to accomplish project objectives.

Inputs

1. **Approved Change Requests**
2. **Project Documents**
3. **Project Management Plan**
4. **Enterprise Environmental Factors (EEFs)**
5. **Organizational Process Assets (OPAs)**

Tools

1. **Expert Judgment**
2. **Project Management Information System (PMIS)**
3. **Meetings**

Outputs

1. **Work Performance Data –** Created by measuring how well the processes from each knowledge area are being performed.
2. **Deliverables –** Products, services, documents, plans, schedules, budget, blueprints, and everything gets made along the way.
3. **Issue Log –** a documentation that contains a list of ongoing and closed issues of the project. It lists issue type, who and when the issue raised, priority, status, and so on.
4. **Implemented Change Requests**
5. **Project Document Updates –** Used to manage information which is not part of the plan. Prepared by PM for his own needs.
6. **Project Management Plan Updates**
7. **OPA Updates**

4 – Manage Project Knowledge (Executing)

A way of using existing knowledge within the organization to achieve the project's objectives and then using new knowledge gained on the project to contribute to the organizations body of knowledge.

Inputs

1. **Project Management Plan**
2. **Project Documents**
3. **Deliverables**
4. **EEFs**
5. **OPAs**

Tools

1. **Expert Judgment**
2. **Knowledge Management Techniques**
3. **Information Management**
4. **Interpersonal/Team/Soft Skills**

Outputs

1. **Lessons Learned Register**
2. **Project Management Plan Updates**
3. **OPA Updates**

5 – Monitoring and Controlling Project Work (Monitoring & Controlling)

- Iterative activity
- Happens throughout the project
- Comparing actual project performance against project management plan.

Inputs

1. **Project Management Plan**
2. **Project Documents**
3. **Work Performance Data**
4. **Agreements**
5. **Enterprise Environmental Factors (EEFs)**
6. **Organizational Process Assets (OPAs)**

Tools

1. **Expert Judgment**
2. **Data Analysis Techniques**
3. **Meetings**
4. **Decision Making**

Outputs

1. **Work Performance Information**
2. **Forecasts**
3. **Recommended Corrective Actions**
4. **Product Document Update**
5. **Project Management Plan Updates**
6. **Change Requests**

6 – Perform Integrated Change Control (Monitoring & Controlling)

- How changes are managed and approved.
- Happens throughout the project after a baseline established.
- Responsibility of project manager.
- Verbal changes happen, but should be documented.
- Any change to project documents **must be documented first** in the **change log** and through **configuration control**.
- When creating the outputs of processes in initiating and planning changes can be made without a formal change request, however, once something lie the charter has been issued, any requested changes would need to go through integrated change control.
- A change in one of the constraints **should be evaluated for impacts** on all of the other constraints.
- You should consider **terminating** projects **with excessive changes** and starting new ones with a more complete set of requirements.
- It is necessary to analyze and approve change requests promptly because slow decision time may negatively affect time, cost or the feasibility of change.

Steps

Whenever there is a change, the following steps must be followed –

1. **Logging** the change request in **change log**.
2. **Analyzing** the impact of proposed change on all project constraints.
3. **Sending** all data to CCB for approval/postponing/rejection.
4. If **approved,** where there are **variances**, plans and **baselines** must be **updated** with new work, and new work should be implemented by **direct and manage work**.
5. If **postponed** or **rejected,** the results must be communicated to requestor/stakeholder.
6. **Logging** the request status in **change log**.

Inputs

1. **Change Requests**
2. **Work Performance Information**
3. **Project Management Plan**
4. **Enterprise Environmental Factors (EEFs)**
5. **Organizational Process Assets (OPAs)**

Tools

1. **Expert Judgment**
2. **Change Control Board (CCB) Meetings**
3. **Change Control Tools –** Software, forms, etc.
4. **Decision Making Techniques**
5. **Data Analysis Techniques**

Outputs

1. **Change Request Status Updates**
2. **Product Document Update**
3. **Project Management Plan Updates**
4. **Change Log**

7 – Closing Project or Phase (Closing)

Steps

1. **Validate Scope –** Confirm all requirements have been met. Happens **after Control Quality.**
2. **Get Formal Acceptance**
3. **Create Project Closure Documents**
   - **Write Lessons Learned**
4. **Handover Deliverables**
5. **Close Contract**
6. **Release project team.**

Stages

1. **Work Closure**
   - Finalizing formal acceptance of work.
   - Updating records to reflect results.
   - Sign-off on work completed.
2. **Contract Closure**
   - Finalizing open claims.
   - Updating records to reflect results.
   - Sign-off on work completed.
   - Certificate of contract closure.
3. **Administrative Closure** – An **internal process.** The confirmation that all of your documents and deliverables are correct.
   - Closing project accounts
   - Analyze project success or failure.
   - Archive project information.
   - Dealing with excess project material.
   - Starting any warranty/guarantee work.
   - Transferring product, service, or result to next phase.
   - Reallocating project facilities, equipment, and other resources.
   - Creating final project reports.
   - Releasing project team.
   - Measuring customer satisfaction.

Characteristics

- **Closing Activities –**
  - Finalize project or phase records
  - Audit project for success or failure
  - Transfer project's results to next phase, production, or operations
  - Measure stakeholder satisfaction
- **Early project closure** implies full closure.
- **All stakeholders** must be involved in the creation of lessons learned.
- **Success** of the project is measured primarily by **customer satisfaction.**
- A project/phase is considered to be closed if the archives are completed.
- Risk is the **lowest** at this stage.
- Should not be delayed until project completion because useful information may be lost.
- At the end of each phases you should review your business case, project charter, and benefits management plan.

Termination

- Sometimes there will be a **termination manager** who will carry out the closing procedures except personnel performance evaluations (which is a core function of PM or whoever supervising the work.)
- **Causes of termination -**
  - **Behavior-oriented reasons –** account for the top causes of termination because it is much more difficult to manage people than things.

- **Excessive Changes –** consider terminating projects with excessive changes and starting new ones with a more complete set of requirements.
- **Starvation –** When the project no longer receives the resources needed to continue.

Inputs

1. **Project Charter**
2. **Project Management Plan**
3. **Accepted Deliveries**
4. **Acceptance Criteria**
5. **Project Documents**
   - **Procurement Documentation**
6. **Business Documents**
   - **Business Case**

Tools

1. **Expert Judgment**
2. **Meetings –**
   - To confirm that deliverables have been accepted.
     To validate that the exit criteria have been met.
   - To formalize completion of contracts.
   - To evaluate the satisfaction of the stakeholders.
   - To gather lessons learned.
   - To transfer knowledge.
   - To celebrate success.
3. **Data Analysis Techniques**

Outputs

1. **Final Product, Service, or Result**
2. **Final Report –** should include recommendations for changing current practices.
3. **Project Document Updates**
4. **Organizational Process Assets (OPAs)**
   - **Lesson Learned**
   - **Historical Information**

Statement of Work (SOW) / Scope of Services

Created by **customer or sponsor.** No formal signs required. Defines the following –

- Purpose
- Project-specific activities and deliverables.
- Project durations and milestones.
- Resource hours.
- Billing rates.
- Service fees.
- Payment schedule and terms.

- Listing of representatives.

Product Analysis

Product Breakdown

Requirements Analysis

System Analysis

System Engineering

Value Analysis (VA) –

- Concerned with **existing products**.
- Involves a current product being analyzed and evaluated by a team, to **reduce costs**, improve **product function** or **both**.
- Value Analysis exercises use a plan which step-by-step, methodically evaluates the product in a range of areas. These include costs, function, alternative components and design aspects such as ease of manufacture and assembly.
- A significant part of VA is a technique called **Functional Analysis**, where the product is broken down and reviewed as a number of assemblies. Here, the function is identified and defined for each product assembly. Costs are also assigned to each one.

Value Engineering (VE) –

- Concerned with **new products**.
- It is applied during product development.
- The focus is on **reducing costs**, **improving function** or **both**, by way of teamwork-based product evaluation and analysis.
- This takes place before any capital is invested in tooling, plant or equipment.

Knowledge Types

Formal/Explicit Knowledge – knowledge that can be quickly and easily expressed through conversations, documentation, figures, and numbers.

- Codified explicit knowledge **lacks context** and is open to different interpretations.

Tacit Knowledge – knowledge that is more difficult to express or transfer to another person because it is personal beliefs, values, knowledge gain from experience, and know-how when doing a task.

- Tacit knowledge cannot be codified, however, creating an atmosphere of trust can motivate people to share their tacit knowledge.

Knowledge Management Techniques

Communities of Practice and Special Interest Groups
Creativity and Ideas Management Techniques / Group Creativity Techniques – Like **brainstorming**, **affinity diagrams**, **mind mapping**, etc.
Discussing Forums and Focus Groups
Knowledge Fairs and Cafes – Participants move between tents to learn fast lessons.
Meetings
Networking with Colleagues
Reverse Shadowing – The expert follows you; the expert offers coaching.
Storytelling – To explain tacit knowledge.
Training Events
Work Shadowing – To follow, or shadow, an expert. • **Passive –** Following and observing without any engagement. • **Active –** Following, observing and engaging.

Configuration Management

The process for applying technical and administrative direction and surveillance of the project implementation. Involves a thorough change control system to ensure the project produces the desired results.

Configuration Identification – The process of identifying attributes of products and labeling them with unique identifiers.
Configuration Status Accounting (CSA) – Recording and reporting of information needed to manage configuration items effectively, including a record of the approved configuration documentation and identification numbers.
Configuration Control (Verification and Auditing) – Verification that the configuration identification for a configuration item is accurate, complete, and will meet specified program needs.

Program/Project Evaluation and Review Technique (PERT)

Program Evaluation and Review Technique (PERT) is a technique adopted by organizations to analyze and represent the activity in a project, and to illustrate the flow of events in a project. PERT serves as a management tool to analyze, define and integrate events. PERT also illustrates the activities and interdependencies in a project. The main goal of PERT is to reduce the cost and time needed to complete a project.

PERT Planning

PERT planning usually involves the following steps –

1. **Identifying Tasks and Milestones** – Every project involves a series of required tasks. These tasks are listed in a table allowing additional information on sequence and timing to be added later.
2. **Placing the Tasks in a Proper Sequence** – The tasks are analyzed and placed in a sequence to get the desired results.
3. **Network Diagramming** – A network diagram is drawn using the activity sequence data showing the sequence of serial and parallel activities.
4. **Time Estimating** – This is the time required to carry out each activity, in three parts –
   - **Optimistic timing** – The shortest time to complete an activity
   - **Most likely timing** – The completion time having the highest probability
   - **Pessimistic timing** – The longest time to complete an activity
5. **Critical Path Estimating** – This determines the total time required to complete a project.

Additional Terms

Performance Measurement Baselines (PMB) – A snapshot of your project's scope, schedule and cost.

- **Scope Baseline**
- **Schedule Baseline**
- **Cost Baseline**

Process Capability Baseline (PCB) – specifies what results to expect when a process is followed. Using PCB, a project manager can predict, at the gross level, effort required at various stages, defect densities, overall quality, and productivity.

Tailoring Processes – determining which processes are appropriate, and the appropriate degree of rigor for each process. You need to measure tailoring needs for each project by considering EEFs.