Project Management Processes, Process Groups and Knowledge areas

Project management as explained by PMBOK (Project Management Body of Knowledge) is accomplished by the appropriate application and integration of 42 logically grouped project management processes. These processes are spread across 5 process groups and 9 knowledge areas.  
  
The five process groups are:

1. Initiating
2. Planning
3. Executing
4. Monitoring & Controlling
5. Closing

The nine knowledge areas are:

1. Project Integration Management
2. Project Scope Management
3. Project Time Management
4. Project Cost Management
5. Project Quality Management
6. Project Human Resources Management
7. Project Communication Management
8. Project Risk Management
9. Project Procurement Management

The processes that belong in each process group, what they do and which knowledge area they represent can be confusing. This post (based on the info in PMBOK) discusses about each process group and briefly explains the processes that belong in each process group. The knowledge area they represent is indicated in brackets after the process. This post could serve as reference for project managers and also help someone preparing for PMP certification.  
  
**Initiating**:   
  
Processes performed to define a new project or a new phase of an existing project.

* **Develop Project Charter (Integration)**: Process of developing a document that formally authorizes a project and documenting initial requirements that satisfy the stakeholders needs and expectations. **Output**: Project Charter
* **Identify Stakeholders (Communication)**: Process of identifying all people or organizations impacted by the project and documenting relevant information regarding their interests, involvement and impact on project success. **Outputs**: Stakeholder register, Stakeholder management strategy

**Planning**:  
  
Processes required to establish the scope of the project, refine the objectives and define the course of action required to attain the objectives of the project.

* **Develop Project Management Plan (Integration):** Process of documenting actions necessary to define, prepare, integrate and coordinate all subsidiary plans. **Outputs**: Project Management plan.
* **Collect requirements (Scope)**: Process of defining and documenting stakeholders' needs to meet the project objectives.**Outputs**: Requirements documentation, requirements management plan and requirements traceability matrix
* **Define scope (Scope)**: Process of developing a detailed description of the project and product.**Outputs:**Project scope statement, project document updates
* **Create WBS (Scope)**: Process of subdividing project deliverables and project work into smaller, more manageable components. **Outputs**: WBS, WBS dictionary, scope baseline, project document updates (WBS - Work Breakdown Structure)
* **Define activities (Time)**: Process of identifying the specific actions to be performed to produce the project deliverables. **Outputs**: Activity list, activity attributes, milestone list
* **Sequence activities (Time)**: Process of identifying and documenting relationships among the project activities. **Outputs:**Project schedule network diagram, project document updates
* **Estimate activity resources (Time)**: Process of estimating the type and quantities of material, people, equipment, or supplies required to perform each activity. **Outputs:**Activity resource requirements, resource breakdown structure, project document updates
* **Estimate activity duration (Time)**: Process of approximating the number of work periods needed to complete individual activities with estimated resources.**Outputs:**Activity duration estimates, project document updates
* **Develop Schedule (Time)**: Process of analyzing activity sequences, durations, resource requirements and schedule constraints to create the project schedule. **Outputs:**Project schedule, schedule baseline, schedule data, project document updates
* **Estimate costs (Cost)**: Process of developing an approximation of the monetary resources needed to complete project activities. **Outputs:**Activity cost estimates, basis of estimates, project document updates
* **Determine budget (Cost)**: Process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.**Outputs:**Cost performance baseline, project funding requirements, project document updates
* **Plan quality (Quality)**: Process of identifying quality requirements and/or standards of the project and product and documenting how the project will demonstrate compliance. **Outputs:**Quality management plan, quality metrics, quality checklists, process improvement plan, project document updates
* **Develop Human Resource plan (Human Resource)**: Process of identifying and documenting project roles, responsibilities and required skills, reporting relationships and creating a staffing management plan. **Output**: Human Resource Plan
* **Plan communications (Communication)**: Process of determining project stakeholder information needs and defining a communication approach.**Outputs:**Communication management plan, project document updates
* **Plan risk management (Risk)**: Process of defining how to conduct risk management activities for a project. **Output**: Risk Management plan
* **Identify Risks (Risk)**: Process of determining which risks may affect the project and documenting their characteristics. **Output:**Risk register
* **Perform Qualitative risk analysis (Risk)**: Process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact. **Output:**Risk register updates
* **Perform Quantitative risk analysis (Risk)**: Process of numerically analyzing the effect of identified risks on overall project objectives. **Output:**Risk register updates
* **Plan risk response (Risk)**: Process of developing options and actions to enhance opportunities and to reduce threats to project objectives. **Outputs:**Risk register updates, risk contract related decisions, project management plan updates, project document updates
* **Plan procurements (Procurements)**: Process of documenting project purchasing decisions, specifying the approach and identifying potential sellers.**Outputs:**Procurements management plan, procurements statement of work, make-or-buy decisions, procurement documents, source selection criteria, change requests

**Executing**:  
  
Processes performed to complete the work defined in project management plan to satisfy the project specifications.

* **Direct & Manage project execution (Integration)**: Process of performing the work defined in the project management plan to achieve the project's objectives. **Outputs:**Deliverables, work performance information, change requests, project management plan updates, project document updates
* **Acquire project team (Human Resource)**: Process of confirming human resource availability and obtaining the necessary team to complete project assignments. **Outputs:**Project staff assignments, resource calendars, project management plan updates
* **Perform quality assurance (Quality)**: Process of auditing the quality requirements and the results from quality control measurements to ensure appropriate quality standards are used. **Outputs:**Organization process assets updates, change requests, project management plan updates, project document updates
* **Develop project team (Human Resource)**: Process of improving the competencies, team interaction and the overall team environment to enhance project performance. **Outputs:**Team performance assessments, enterprise environmental factors updates
* **Manage project team (Human Resource)**: Process of tracking team member performance, providing feedback, resolving issues and managing changes to optimize project performance. **Outputs**: Enterprise environmental factors updates, organization process assets updates, change requests, project management plan updates
* **Distribute Information (Communication)**: Processing of making relevant information available to project stakeholders, as planned. **Output:**Organization process assets updates
* **Manage stakeholder expectations (Communication)**: Process of communicating and working with stakeholders to meet their needs and addressing issues as they occur. **Outputs:**Organization process assets updates, change requests, project management plan updates, project document updates
* **Conduct procurements (Procurements)**: Process of obtaining seller responses, selecting a seller and awarding a contract. **Outputs:**Selected sellers, procurement contract award, resource calendars, change requests, project management plan updates, project document updates

**Monitoring & Controlling**:  
  
Processes required to track, review and regulate the progress and performance of the project.

* **Monitor & Control project work (Integration)**: Process of tracking, reviewing and regulating the progress to meet the performance objectives defined in the project management plan. **Outputs:**Change requests, project management plan updates, project document updates
* **Perform Integrated Change control (Integration)**: Process of reviewing all change requests, approving changes and managing changes to the deliverables, organization process assets, project documents and project management plan. **Outputs:**Change requests status updates, project management plan updates, project document updates
* **Verify scope (Scope)**: Process of formalizing acceptance of the completed project deliverables. **Outputs:**Accepted deliverables, change requests, project document updates
* **Control scope (Scope)**: Process of monitoring the status of the project and product scope and managing changes to the scope baseline. **Outputs:**Work performance measurements, organization process assets updates, change requests, project management plan updates, project document updates
* **Control schedule (Time)**: Process of monitoring the status of the project to update project progress and managing changes to the schedule baseline.**Outputs:**Work performance measurements, organization process assets updates, change requests, project management plan updates, project document updates
* **Control costs (Cost)**: Process of monitoring the status of the project to update the project budget and managing changes to the cost baseline.**Outputs:**Work performance measurements, budget forecasts, organization process assets updates, change requests, project management plan updates, project document updates
* **Perform quality control (Quality)**: Process of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes. Outputs are quality control measurements, validated changes, validated deliverables, organization process assets updates, change requests, project management plan updates, project document updates
* **Report performance (Communication)**: Process of collecting and distributing performance information including status reports, progress measurements and forecasts. **Outputs:**Performance reports, organization process assets updates, change requests
* **Monitor and control risks (Risk)**: Process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks and evaluating risk process effectiveness throughout the project. **Outputs:**Risk register updates, organization process assets updates, change requests, project management plan updates, project document updates
* **Administer procurements (Procurements)**: Process of managing procurement relationships, monitoring contract performance and making changes/corrections as needed. **Outputs:** Procurement documentation, organization process assets updates, change requests, project management plan updates

**Closing**:  
  
Process performed to finalize all activities across all process groups to formally close the project or phase.

* **Close project or phase (Integration)**: Process of finalizing all activities across all of the project management process groups to formally complete the project or phase. **Outputs:**Final product, service or result transition, organization process assets updates
* **Close procurements (Procurement)**: Process of completing each project procurement. **Outputs :**Closed procurements, organization process assets updates