**Project Management – Introduction**

Michael D. Harper, Ph.D.

***Overview***

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| *“The art and science of transforming an idea into a product or service.”*  **What is a project?**  *“A project is a temporary endeavor undertaken to create a unique product or service.”*  **What is project management?**  *“Project management is the application of knowledge, skills, tools, and techniques*  *to project activities that fulfills the project scope on time and within budget*  *in order to meet or exceed stakeholder needs and expectations.”*  **Project Management Organizational Structure**   * *Project, Program, Portfolio, PMO*   **Stakeholders**   * *Sponsor, Project Manager, Team Members, Vendors*   **PMBoK (Project Management Body of Knowledge)**   * *Cycles, Phases, Process Groups, Knowledge Areas, ITTO*   . |
| **Project Management Checklist.**   * **Project Charter –** *Initiate the project.* * **Project Scope Statement –** *Define the project.* * **Integrated Change Control** – *Expect change & Plan for change* * **Stakeholder Analysis** – *Define, Communicate, Validate* * **Project Management Plan –** *Plan, execute, control, and close the project.*   **Project Management Extensions.**   * Agile Project Management * Extreme Project Management * Complex, International, Sustainable, & Virtual Projects   **Types of Projects.**   * Event Project Management * Construction Project Management * Information Technology Project Management * Systems Engineering Project Management * Urban Planning Project Management * Global Supply Chain Project Management   . |

**Project Management – Definitions**

*“The art and science of transforming an idea into a product or service.”*

**Origination of ideas for projects.**

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|  |  | Idea 🡪 Project | | | |  |  |
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|  |  |  |  |  |  |  |  |
| Need | |  | Opportunity | |  | Directive | |

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| **NEED** | **OPPORTUNITY** | **DIRECTIVE** |
| Use resources as needed | Use resource if available | Use minimum resources |
| Use most reliable solutions | Use innovative solutions | Use most direct solution |
| Achieve goal in minimum time | Achieve best goal possible | Achieve goal to just meet requirements |

**What is a project?**

“A project is a temporary endeavor undertaken to create a unique product or service.”

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| Projects | |  | 🡨 🡪 | |  | Ongoing  Operations | |
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| Time | |  | Uniqueness | |  | Objectives | |

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|  | **Project vs. Operations** | | |  |
|  | Projects | ↔ | Ongoing Operations |  |
| Time | Short-term  Fixed  Success | ↔ | Long-term  Continual  Resilient |  |
| Uniqueness | Deliverable  Process  Stakeholders  Timing (Resources,Assets) | ↔ | Family of Products/Services  Continual Improvement  Business Goals  Growth |  |
| Objectives | Stakeholder-focused | ↔ | Business-focused |  |
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**Project vs. Operations**

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| Nature  \_\_\_Logistics for the next monthly board meeting  \_\_\_Logistics for a week retreat in the mountains for the executive board  \_\_\_Replace light bulbs in conference room  \_\_\_Install new lighting in conference room  \_\_\_Insuring successful upgrade of software on all computers  \_\_\_Develop new software for inclusion in next product offering  \_\_\_Evaluate international vendor performance  \_\_\_Conduct international vendor search | Feasibility  \_\_\_Create a summit conference on critical issues to your company of all industry leaders including your competitors  \_\_\_Design and install conference room with leading edge lighting technology  \_\_\_Develop artificial intelligence software to learn from users the best way to do their job and then implement learned behavior  \_\_\_Expand global influence of supply chain to effect political stability in host countries |

**What is project management?**

“Project management is the application of knowledge, skills, tools, and techniques

to project activities that fulfills the project scope on time and within budget

in order to meet or exceed stakeholder needs and expectations.”

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|  | “Project management is the |  |
| Integration | application of  ***knowledge, skills, tools, and techniques*** | PMBOK |
| Flexibility | to project *activities* that fulfills the  ***project scope on time and within budget*** | Triple Constraint |
| Focus | in order to meet or exceed  ***stakeholder*** needs and expectations.” | Success |

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| .   |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Integration | | | | |  | Flexibility | | | |  | Focus | | | | (PMBOK) | | | | |  | (Triple Constraint) | | | |  | (Success) | | | |  | | | | |  |  | | | |  |  | | | |  |  |  |  |  |  |  |  | |  |  | Stakeholders | | | |  |  |  |  |  |  |  |  | |  |  |  |  |  | | Knowledge | |  | Skills | | 🡪 |  | Scope | |  | 🡪 |  |  | Needs | |  | 🡪 |  |  | 🡪 |  |  | |  |  |  |  |  | 🡪 |  |  |  |  | 🡪 |  |  |  | | Tools | |  | Techniques | | 🡪 | Time |  |  | Cost | 🡪 |  |  | Expectations | |  |  |  | |  |  |  |   . |

***Key Project Management Terms.***

**Project Management Checklist.**

* **Project Charter –** *Initiate the project.*
* **Project Scope Statement –** *Define the project.*
* **Integrated Change Control** – *Expect change & Plan for change*
* **Stakeholder Analysis** – *Define, Communicate, Validate*
* **Project Management Plan –** *Plan, execute, control, and close the project.*

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| **Project Management Life Cycles – PMBoK** | | |
|  | Traditional Project Management |  |
|  |  |  |
| Scope 🡪 Plan 🡪 Launch 🡪 Monitor & Control 🡪 Close | | |

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| **Project Management Life Cycles – Wysocki** | | |
|  | Traditional Linear |  |
|  | Traditional Incremental |  |
|  | Agile Iterative |  |
|  | Agile Adaptive |  |
|  | Extreme (Emertxe) |  |
|  |  |  |
| Scope 🡪 Plan 🡪 Launch 🡪 Monitor & Control 🡪 Close 🡪 Next 🡪 Close | | |

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**Life Cycles**

**Project Life Cycle**

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|  |  |  |  |  |  |  |  |  |  |  |  |  | *Time* | |
| Process  Groups | Initiating | | Planning | | | Executing &  Monitoring &  Controlling | | | | | | | Closing | |

**Product Life Cycle**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| Activity |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |  |  |  |  | Time | |
| Stages | Introduction | | Growth | | | Maturity | | | | | Decline | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Project1 | Project2 | Project3 | Project4 | Project5 | Project6 | Project7 | Project8 |

**Project Management – Organizational Structure**

**General Organizational Structure**

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|  |  |  |  |  |  |  |  |  |  |  |  |
|  | Executive Management | | | | |  |  |  |  |  |  |
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|  |  |  | Administration | |  | Functional | |  | Project | |  |
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**Project Management Structure**

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|  | Project Management Office (PMO) | | | | | | | |  |
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|  |  |  | Portfolio  Management | |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
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|  |  |  |  |  | Program  Management | |  |  |  |
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|  |  |  |  |  |  |  | Project  Management | |  |
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**Functional Organizational Chart**

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|  |  |  |  |  | CEO | | | |  |  |  |  |  |
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| Human  Resources | |  | Finance | |  | Marketing | |  | Information  Technology | |  | Operations | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Staff | |  | Staff | |  | Staff | |  | Staff | |  | Staff | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Staff | |  | Staff | |  | Staff | |  | Staff | |  | Staff | |

**Project Organizational Chart**

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| Project  Manager | |  | Project  Manager | |  | Project  Manager | |  | Project  Manager | |  | Project  Manager | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Team  Members | |  | Team  Members | |  | Team  Members | |  | Team  Members | |  | Team  Members | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Staff | |  | Staff | |  | Staff | |  | Staff | |  | Staff | |

**Matrix Organizational Chart**

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|  |  |  |  |  | CEO | | | |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Program  Managers | |  | Finance | |  | Marketing | |  | Information  Technology | |  | Operations | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Project Manager | |  | Staff | |  | Staff | |  | Staff | |  | Staff | |
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| Project Manager | |  | Staff | |  | Staff | |  | Staff | |  | Staff | |
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**Matrix Organizational Chart**

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|  |  |  |  |  | CEO | | | |  |  |  |  |  |
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| Program  Managers | |  | Finance | |  | Marketing | |  | Information  Technology | |  | Operations | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Project Manager | |  | Staff  Authority | |  | Staff | |  | Staff | |  | Staff | |
|  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Project Manager | |  | Staff | |  | Staff | |  | Staff | |  | Staff | |
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**Organizational Authority & Coordination**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | | |  |
|  |  |  | Project Manager Authority | | |  |
|  |  |  | Low |  | High |  |
|  | Coordination | Low | Functional |  | Project |  |
|  |  |  |  |  |  |
|  | High | Weak Matrix |  | Strong Matrix |  |
|  |  |  |  |  |  |  |

**Project Management Office (PMO) – PMBoK**

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| A project management office (PMO) is a management structure that standardizes the project-related governance processes and facilitates the sharing of resources, methodologies, tools, and techniques. |

**Project Support Office (PSO) – Wysocki**

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| A Project support office (PSO) is a temporary or permanent organizational unit that provides a portfolio of services to support project teams that are responsible for a specific portfolio of projects. |

**Functional Organizational Chart**

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|  |  |  |  |  | CEO | | | |  | PSO | | |  |  |  |
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| Human  Resources | |  | Finance | |  | Marketing | |  | Information  Technology | |  | Operations | |  | PSO |
|  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Staff | |  | Staff | |  | Staff | |  | Staff | |  | Staff | |  | PSO |
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| Staff | |  | Staff | |  | Staff | |  | Staff | |  | Staff | |  |  |
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**Project Organizational Chart**

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|  |  |  |  |  | CEO | | | |  | PSO | | |  |  |  |
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| Project  Manager | |  | Project  Manager | |  | Project  Manager | |  | Project  Manager | |  | Project  Manager | |  | PSO |
|  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Staff | |  | Staff | |  | Staff | |  | Staff | |  | Staff | |  | PSO |
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| Staff | |  | Staff | |  | Staff | |  | Staff | |  | Staff | |  |  |
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**Stakeholders**

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| --- | --- | --- | --- |
| ***A stakeholder is anyone or anything that is involved in,***  ***has interest in, or stands to gain or lose from a project*** | | | |
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| Stakeholder Importance:   * supports definition of project expectations * facilitates project execution and control * validates project success | | | |

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| ***Stakeholders*** |
| **Sponsor**  **Project Manager**  **Project Team Members**  **Vendors**  **Customers**  **Community**  **Environment**  **Etc.**  **---** |

***Key Stakeholder*: Project Manager**

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| **The project manager is responsible for all aspect of the project.**   * **Design and Planning.** * **Internal Management & Coordination.** * **External Communication & Representation.** |

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| **Project Manager Knowledge.**   |  |  |  | | --- | --- | --- | | Project Management Knowledge | vs. | Domain Knowledge |   . |
| **Project Manager Skills.**   |  |  | | --- | --- | | Communication Skills | Negotiation Skills | | Organization Skills | Leadership Skills | | Problem Solving Skills | Team Building Skills |   . |
| **Project Manager Characteristics.**   |  |  | | --- | --- | | Personality | Experience |   . |

**PMBoK: Project Management Body of Knowledge**

**Reference:** A Guide to the Project Management Body of Knowledge, (PMBOK), 6th Edition, 2017, Project Management Institute, Inc., ISBN: 9781628251845

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| **PMBOK – Cycles, Phases, Process Groups, Knowledge Areas, ITTO**   * Cycles * Product Life Cycle   + Introduction, Growth, Maturity, Decline * Project Life Cycle   + Initiating, Planning, Executing, Monitoring, Controlling, Closing * Phases.   + Project Life Cycle Phases.     - Concept, Development, Implementation, Close-out   + Project Time Phases.     - Sequential, Overlapping, Iterative   + Product Life Cycle Phases.     - Design, Prototype, Final Assembly * Process groups.   + Initiating Process Group. Processes needed to start the project.   + Planning Process Group. Processes needed to determine what is to be done in the project.   + Executing Process Group. Processes needed to do the project.   + Monitoring and Controlling Process Group. Processes needed to manage the project.   + Closing Process Group. Processes needed to finalize the project when done. * Knowledge areas.   + Project Integration Management   + Project Scope Management   + Project Schedule Management   + Project Cost Management   + Project Quality Management   + Project Resource Management   + Project Communications Management   + Project Risk Management   + Project Procurement Management   + Project Stakeholder Management * ITTO.   + Inputs, Tools, Techniques, Outputs   . |
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PMBOK 6th Edition

**Project Management Knowledge Areas (10)**

**Project Management Processes (49)**

|  |  |
| --- | --- |
| Project Integration Management   1. Develop Project Charter 2. Develop Project Management Plan 3. Direct and Manage Project Work 4. Manage Project Knowledge 5. Monitor and Control Project Work 6. Perform Integrated Change Control 7. Close Project or Phase   Project Scope Management   1. Plan Scope Management 2. Collect Requirements 3. Define Scope 4. Create WBS 5. Validate Scope 6. Control Scope   Project Schedule Management   1. Plan Schedule Management 2. Define Activities 3. Sequence Activities 4. Estimate Activity Durations 5. Develop Schedule 6. Control Schedule   Project Cost Management   1. Plan Cost Management 2. Estimate Costs 3. Determine Budget 4. Control Costs   Project Quality Management   1. Plan Quality Management 2. Manage Quality 3. Control Quality | Project Resource Management   1. Plan Resource Management 2. Estimate Activity Resources 3. Acquire Resources 4. Develop Team 5. Manage Team 6. Control Resources   Project Communications Management   1. Plan Communications Management 2. Manage Communications 3. Monitor Communications   Project Risk Management   1. Plan Risk Management 2. Identify Risks 3. Perform Qualitative Risk Analysis 4. Perform Quantitative Risk Analysis 5. Plan Risk Responses 6. Implement Risk Responses 7. Monitor Risks   Project Procurement Management   1. Plan Procurement Management 2. Conduct Procurements 3. Control Procurements   Project Stakeholder Management   1. Identify Stakeholders 2. Plan Stakeholder Engagement 3. Manage Stakeholder Engagement 4. Monitor Stakeholder Engagement |

**Project Management Process Groups (5)**

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| Chapter 3 (PMBOK 5th Edition)   1. Initiating 2. Planning 3. Executing 4. Monitoring and Controlling 5. Closing |  |  |  |  |  |  |  |  |  |  |  |
|  |  | Monitoring and Controlling | | | | | | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  | Planning | | |  |  |  |  |
|  | Initiating | | 🡪 | 🡪 |  | 🡪 | 🡪 | Closing | |  |
|  |  |  |  | Executing | | |  |  |  |
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**Interrelationship between:**

* **Project Management Knowledge Areas (10)**
* **Project Management Processes (49)**
* **Project Management Process Groups (5)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Process Groups | | | | |
|  | **Processes** | Initiating | Planning | Executing | Monitoring &  Controlling | Closing |
| Knowledge Areas | Integration | 1 | 2 | 3,4 | 5,6 | 7 |
| Scope |  | 1,2,3,4 |  | 5,6 |  |
| Schedule |  | 1,2,3,4,5 |  | 6 |  |
| Cost |  | 1,2,3 |  | 4 |  |
| Quality |  | 1 | 2 | 3 |  |
| Resource |  | 1,2 | 3,4,5 | 6 |  |
| Communications |  | 1 | 2 | 3 |  |
| Risk |  | 1,2,3,4,5 | 6 | 7 |  |
| Procurement |  | 1 | 2 | 3 |  |
| Stakeholder | 1 | 2 | 3 | 4 |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Examples of Output | | |
| Knowledge Areas | Integration | Charter |  | Project Plan |
| Scope | Scope Statement |  | WBS |
| Schedule | Schedule |  | Gantt, CPM, PERT |
| Cost | Budget |  | EVM/EVA |
| Quality | QP/QA/QC |  | 7 Basic Tools |
| Resource | RAM |  | SMP |
| Communications | Meetings |  | Communications Plan |
| Risk | Risk Register |  | Risk Responses |
| Procurement | RFP |  | Contracts |
| Stakeholder | Register |  | Stakeholder Plan |

**PMBoK Knowledge Areas Breakdown.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  | | **Knowledge**  **Area** | |  | |  |
|  | |  |  |  | |  |  |  | |  |
|  | |  |  |  | |  |  |  | |  |
| **Process** | | |  | **Process** | | | **. . .** | **Process** | | |
|  |  | |  |  |  | |  |  |  | |
|  | **ITTO** | |  |  | **ITTO** | |  |  | **ITTO** | |
|  | **1. Inputs** | |  |  | **1. Inputs** | |  |  | **1. Inputs** | |
|  | **2. Tools and**  **Techniques** | |  |  | **2. Tools and**  **Techniques** | |  |  | **2. Tools and**  **Techniques** | |
|  | **3. Outputs** | |  |  | **3. Outputs** | |  |  | **3. Outputs** | |

For example, consider the structure of the Project Cost Management knowledge area.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Project Cost Management** | | | | |  |  |  |  |
|  |  |  |  |  |  |  | |  |  |  |  |  |
|  |  |  |  |  |  |  | |  |  |  |  |  |
| **Plan Cost**  **Management** | |  | **Estimate**  **Costs** | |  | **Determine**  **Budget** | | |  | **Control**  **Costs** | |  |
|  |  |  |  |  |  |  |  | |  |  |  |  |
|  | **ITTO** |  |  | **ITTO** |  |  | **ITTO** | |  |  | **ITTO** |  |
|  | **1. Inputs** |  |  | **1. Inputs** |  |  | **1. Inputs** | |  |  | **1. Inputs** |  |
|  | **2. Tools and**  **Techniques** |  |  | **2. Tools and**  **Techniques** |  |  | **2. Tools and**  **Techniques** | |  |  | **2. Tools and**  **Techniques** |  |
|  | **3. Outputs** |  |  | **3. Outputs** |  |  | **3. Outputs** | |  |  | **3. Outputs** |  |

|  |
| --- |
| **Plan Cost Management** |
| Inputs  1. Project charter  2. Project Management Plan   * Schedule management plan * Risk management plan   **3. Enterprise environmental factors**  **4. Organizational process assets**  Tools & Techniques  1. Expert judgment  2. Data Analysis  3. Meetings  Outputs  1. Cost management plan |