

MGMT 565

Project Management

Module 6A: What is Resource
Management?

About Resource Management

- Projects can be large and complex endeavors. Often the sponsoring organizations must invest significant amount of resources to successfully deliver projects.
- Resources can be human resources, physical assets, and non-physical assets. For example:
 - Human resources – people
 - Physical assets – office space, equipment like machines, tools,
 - Non-physical resources – intellectual property, energy, virtual computing environment
- All resources share some common traits:
 - They are finite; some resources are precious and rare
 - They are depleteable
 - Some may have substitutions
 - They require funding to acquire, maintain, and/or use
 - They can be contentious, either internally or externally
- As such, it is project managers responsibility to manage the use of resources diligently.

Project Resource Management

In PMBOK® Guide 6.0, there are six processes in this knowledge area:

- Plan resource management
- Estimate activity resources
- Acquire resources
- Develop team
- Manage team
- Control resources

* Adopted from PMBOK® Guide 6th Edition

Plan Resource Management

- * Plan resource management is the process of defining how to estimate, acquire, manage, and use physical and human project resources.
- Project managers, typically working in an integrated fashion with scope definition and schedule development, can examine and analyze the project activities to determine the type of resources required for performing those activities.
- Most of the physical resources are generally straightforward. Thus, this series of modules dedicate most of the attention to human resources.
- On human resources, technical or hard skills & behavioral or soft skills are important considerations.
 - Hard skills include: project management capability and relevant subject matter expertise
 - Soft skills include: the ability to work in teams, interpersonal skills

* Adopted from PMBOK® Guide 6th Edition

Project Management Skills

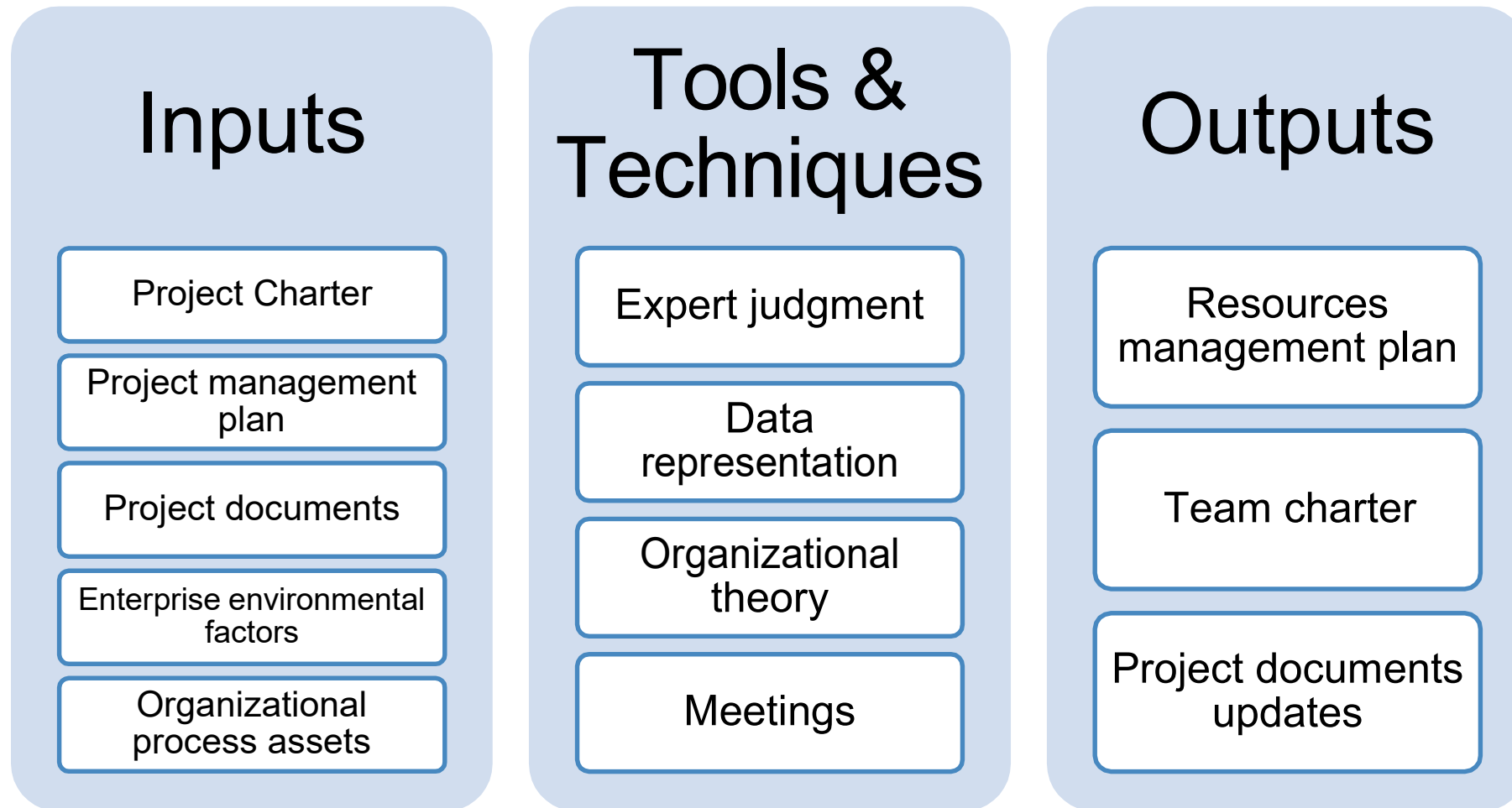
Technical

- Analyze business requirements and develop create work breakdown structure
- Estimate time, resources, and cost
- Create integrated project schedule
- Compress schedule when required
- Establish change management board
- Manage resources, including assigning people
- Institute project management processes to plan, monitor, and control project

Behavioral

- Manage stakeholder expectations
- Work with difficult people, especially in difficult situations
- Select the right people for the project, especially in a diverse and international environment
- Create a high performance project team
- Deal with complicated situations, such as work schedule delays
- Ability to handle stress, manage ambiguity and uncertainties, and lead teams

9.1 Plan Resource Management



Plan Resource Management

- The Resource Management Plan describes how resources are assigned to project activities to accomplish objectives
- Human resources include team members and other labor
- Physical resources include facilities, equipment and supplies
- This process is performed once during planning and then serves as a robust yet flexible reference point for resource management throughout the project
- Resource planning must account for the availability of, and competition for, scarce resources
- Resources may be internal to the organization or external through procurement processes
- It may be revised based on interactions with other management plans
- It is a component of the Project Management Plan

Responsibility Assignment Matrix (RAM)

- A RAM defines the connections between resource assignments, work packages, and activities
- High level RAMs matches larger groups or teams to WBS components (work package or higher)
- Low level RAMs match individuals to specific work packages
- The matrix format allows only a single entry for each work package, so there is no confusion about assignments.
- A RACI chart is a special version of RAM that designates Responsible, Accountable, Consult, or Inform
- **ONLY ONE RESOURCE SHOULD BE ACCOUNTABLE!**

* Adopted from PMBOK® Guide 6th Edition

RACI Chart

- RACI (Responsible, Accountable, Consult, and Inform) is the most common type of RAM
 - Responsible – Project team member who owns the delivering of this deliverable
 - Accountable – Project leader (but can also be a team member) who will review and ultimately sign off on the deliverable, and thus owning the results
 - Consult – Project team member who provides inputs, such as subject matter experts (SMEs)
 - Inform - Project team member who must be informed of the outcome of the deliverable. No input is required.

	Person or Role				
Activity	Person 1	Person 2	Person 3	Person 4	Person 5
A	A	R	I	I	I
B	R	A	C	I	C
C	I	A	R	I	I
D	C	R	A	I	I
E	R	C	C	A	I
F	I	I	A	C	R
G	C	C	I	R	A

Team Operating Principles

To create a high performance team, the project manager should develop, communicate, train, and reinforce a basic set of team operating principles:

- Determine how meetings will be conducted
- Establish how decisions will be made
- Clarify how escalations (issues, risks, and changes) are handled
- Establish how work gets done, including reporting
- Establish how everyone will treat each other with respect

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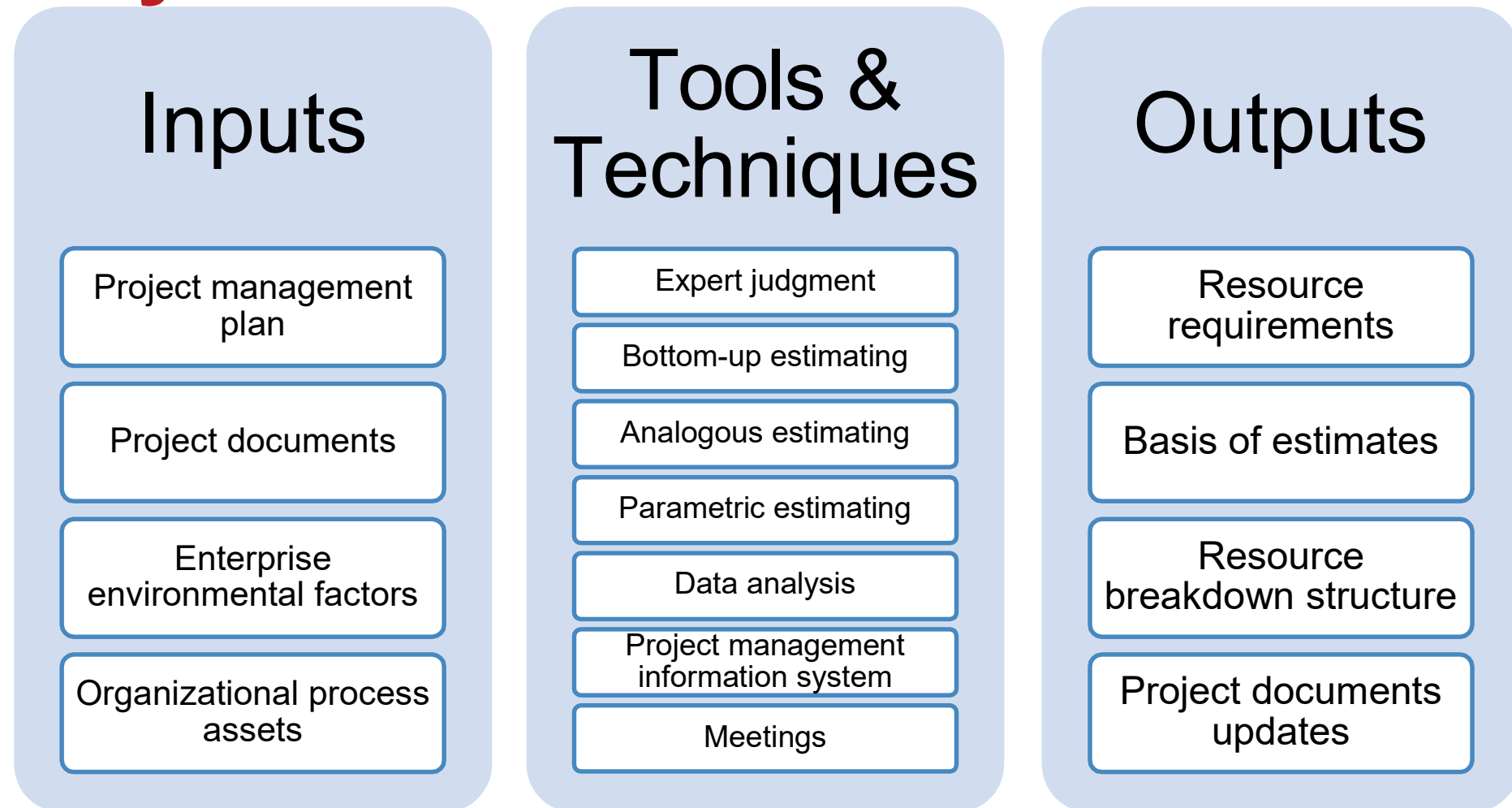
**Module 6B: How to Estimate Activity
Resources**

Estimate Activity Resources

- * Estimate Activity Resources is the process of estimating team resources and the type and quantities of material, equipment, and supplies necessary to perform project work.
- Some important questions to consider:
 - What type of resources does the project need?
 - For people, how many resources of each type and experience level are needed?
 - For other assets, how much resources and at what quality are required?
 - What is the company policies with regards to hiring external contractors?
 - What are the support consideration for human resources – information systems, physical space, software, etc.?
 - Are there constraints on how people are recruited, hired, scheduled, and released?
 - How to conduct procurement of resources in the organization?

* Adopted from PMBOK® Guide 6th Edition

PMBOK 9.2: Estimate Activity Resources



Estimate Activity Resources

- Activity resources include personnel, equipment, supplies, and materials, defined by type, quantity and other characteristics
- Resource calendars provide information about the availability of resources, both human and physical
- This process may be performed in parallel with estimating for schedule and costs
- Team members contribute their expertise in estimating resources required
- Realistic resource estimates will emerge from collaboration, multiple techniques and iteration
- Resource estimates are added to the WBS Dictionary and Activity List

Potential Pool of Human Resources

- Organizational/functional/administrative units
 - Cost and internal transfer issues
 - In a matrix environment, there should be discussions to discuss how the resources can be best managed when there are multiple reporting lines
- Location
 - Co-located team or virtual
 - Is travel required
 - Time zones and normal working hours
- Skill and experience levels
 - What are the required skills and experiences?
 - Which is more important – soft or hard skills?
 - Typically, the more experienced resources requires more funding
- Professional discipline
 - For example, is a PMP certified project manager required?
- Type of work
 - What are the range of responsibilities? What's the appropriate job titles?

Estimate Activity Durations

Estimating Challenges:

- Law of Diminishing Returns: Effort is not sustainable and productivity will decrease at a certain point. For personnel: “We’re only human”
- Parkinson’s Law: “Work expands so as to fill the time available for its completion” (bureaucracy)
- Procrastination: Stress or lack of motivation
- Padding: Subjective increase in estimate; substitute for methodical risk analysis
- Excess optimism: Decrease in estimate due to risk aversion or desire to please

Estimate Activity Durations

Estimating Challenges (Continued):

- The relationship between resources, cost and schedule may not be simple and linear
- Additional resources generally increase costs and reduce schedule time
- Resources may be predetermined due to the activity or preselected in the Project Charter
- Technological advances may result in efficiencies and decrease cost or duration. Consider tradeoffs between labor and automation
- Monitor interactions across resources, schedule, cost, and risks

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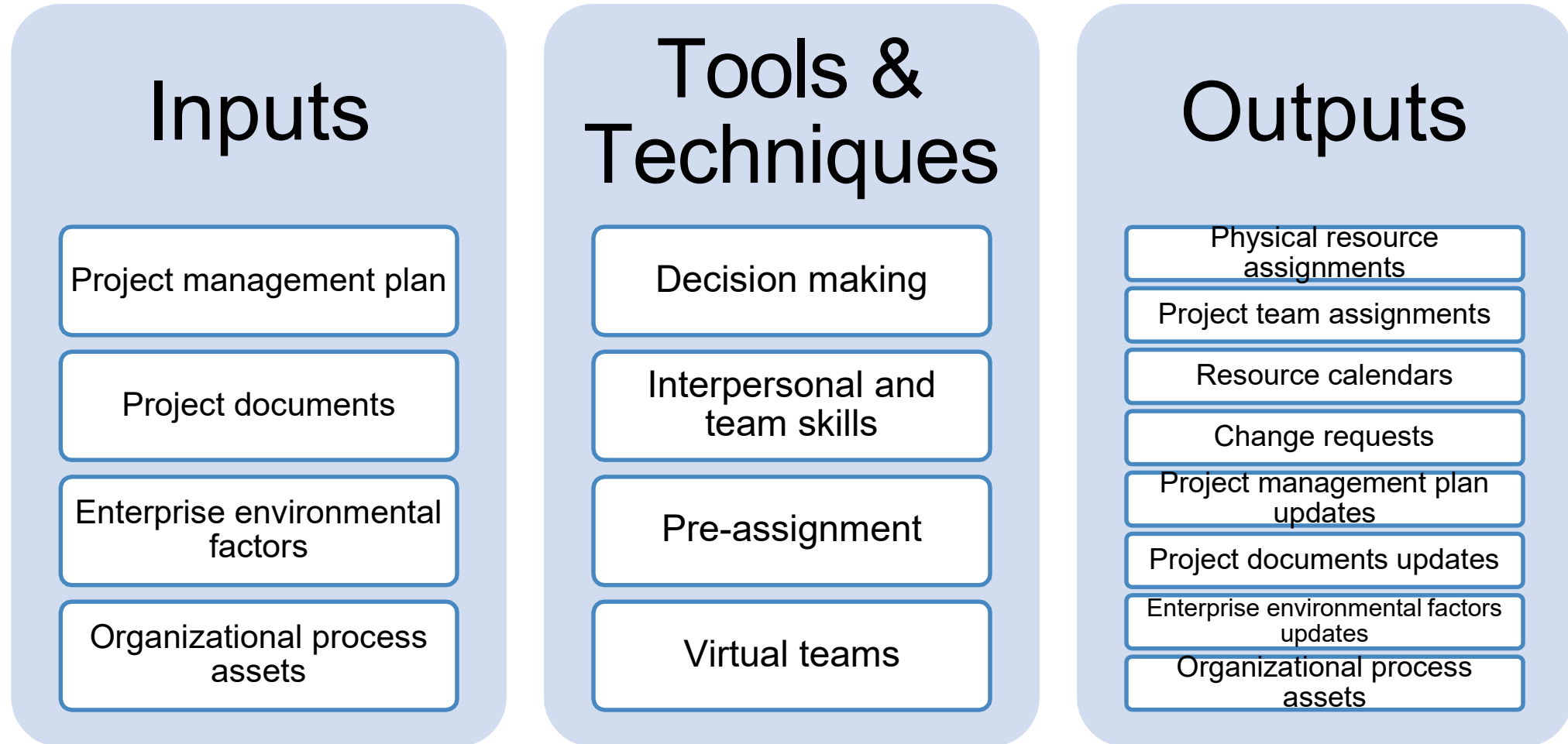
Module 6C: How to Acquire Resources
and Develop Teams

Acquire Resources

- After estimating the resources required, project managers now need to obtain the resources for the project.
- Since resources can be expensive (e.g. people cost), can have a limited useful life (e.g. perishable products or even technology), or can take significant lead time to acquire, it is important for plan the schedule of acquiring resources accurately.

* Adopted from PMBOK® Guide 6th Edition

PMBOK 9.3: Acquire Resources



Acquiring Human Resources

For human resources, some common questions include:

- When to onboard project team members? How to most effectively enculturate them on the project team so they can contribute quickly?
- How to motivate people? Why are they joining the project team? “What’s in it for them?”
- How to best reward project team members?
- Who can oversee their work to ensure quality work products?
- When their work is done, when and how to best

release them from the project?

Resource Documents

- Project managers leverage or create these planning documents, especially for large and complex projects:
 - Project schedule - shows the detailed activities and their timing
 - Resource calendar – highlights when the resources are needed and available for the project
 - Resource requirements – identifies the basic requirements of the resources
 - Stakeholder register – human resources on projects are stakeholders and thus they need to be managed diligently
- Some organizations also have clear policies and guidelines with regards to the acquisition of people.
 - These policies and even lessons learned can be important for the project manager.

Develop Team

- * This is the process of creating a capable team by improving team member's competencies, enabling quality interaction among themselves, and developing a positive team environment.
- The key benefits is to enhance the overall project performance by creating excitement and belong among the team members, reduce attribution, improve motivation, and create a learning and nurturing environment.

* Adopted from PMBOK® Guide 6th Edition

PMBOK 9.4: Develop Team

Inputs

Project management plan

Project documents

Enterprise environmental factors

Organizational process assets

Tools & Techniques

Colocation

Virtual teams

Communication technology

Interpersonal and team skills

Recognition and rewards

Training

Individual and team assessments

Meetings

Outputs

Team performance assessments

Change requests

Project management plan updates

Project documents updates

Enterprise environmental factors updates

Organizational process assets updates

Stages of Team Development

Project teams go through a number of stages, even though skipping a particular state is possible:

- **Forming** - Team members become acquainted with each other; they tend to be independent operators and not open at this point as they learn about others on the project team
- **Storming** - Team members start working together some sometimes competition for roles or differences in ideas can create tensions and conflicts
- **Norming** - Team members began to adjust their behaviors to conform to the team's norm and learn to trust one another
- **Performing** - Team members are able to work together and the primary focus is on performance
- **Adjourning** - Team members complete project activities and move on to the next assignment

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Module 6D: How to Manage
Teams and Control Resources

Manage Team

- * Manage Team is the process of monitoring project team member performance, intervening as necessary such as providing feedback or resolving issues, encouraging and motivating them, and optimizing people and teams to achieve project results.
- Project managers should assign people to specific activities and level of responsibilities. To facilitate communication, use tools such RAM (Responsibility Assignment Matrix) or RACI (Responsible, Accountable, Consulted, and Informed) to ensure clarity.
- Resources assignments should be centralized in a resource plan and analyzed for potential issues such overloading.

* Adopted from PMBOK® Guide 6th Edition

PMBOK 9.5: Manage Team

Inputs

Project management plan

Project documents

Work performance reports

Team performance assessments

Enterprise environmental factors

Organizational process assets

Tools & Techniques

Interpersonal and team skills

Project management information system

Outputs

Change requests

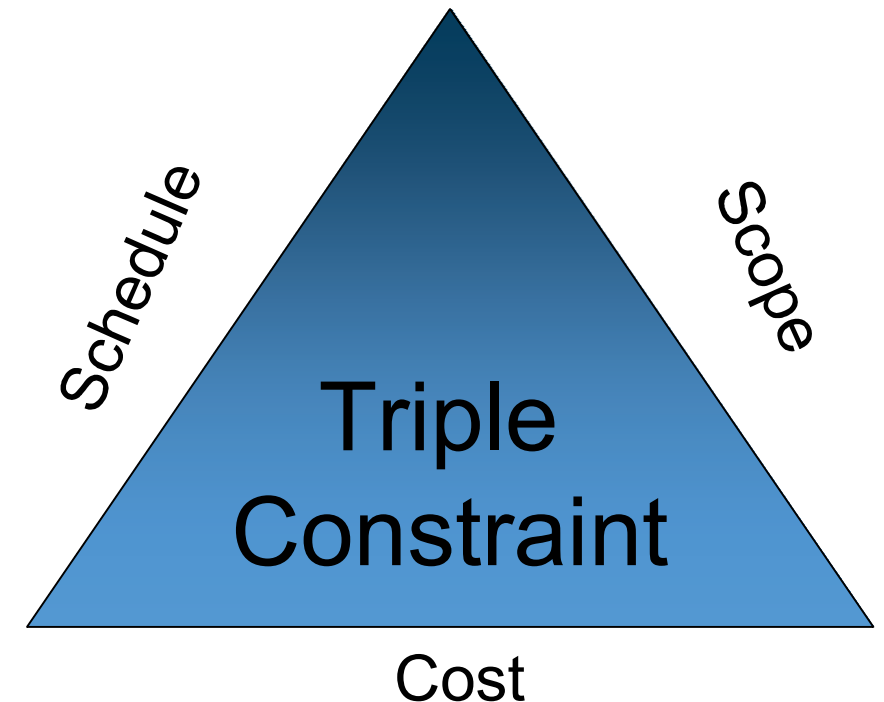
Project management plan updates

Project documents updates

Enterprise environmental factors updates

Managing Conflicts

- Since projects are often in a constrained environment, conflicts are inevitable.
- Conflicts are disagreements between the triple constraints that boil over into obstacles.
- There are three general types of conflicts*:
 - Relational (who)
 - Task (what)
 - Process (how)
- The impact of conflict on success is complex.
 - Negative findings:
 - Deteriorating atmosphere / emotions
 - Productivity decline
 - Spiraling conflicts – ultimately killing the project
 - Positive benefits of conflicts:
 - Reduces group think
 - Promotes group discussion to create greater collaboration
 - Solutions / outcomes are typically more sound



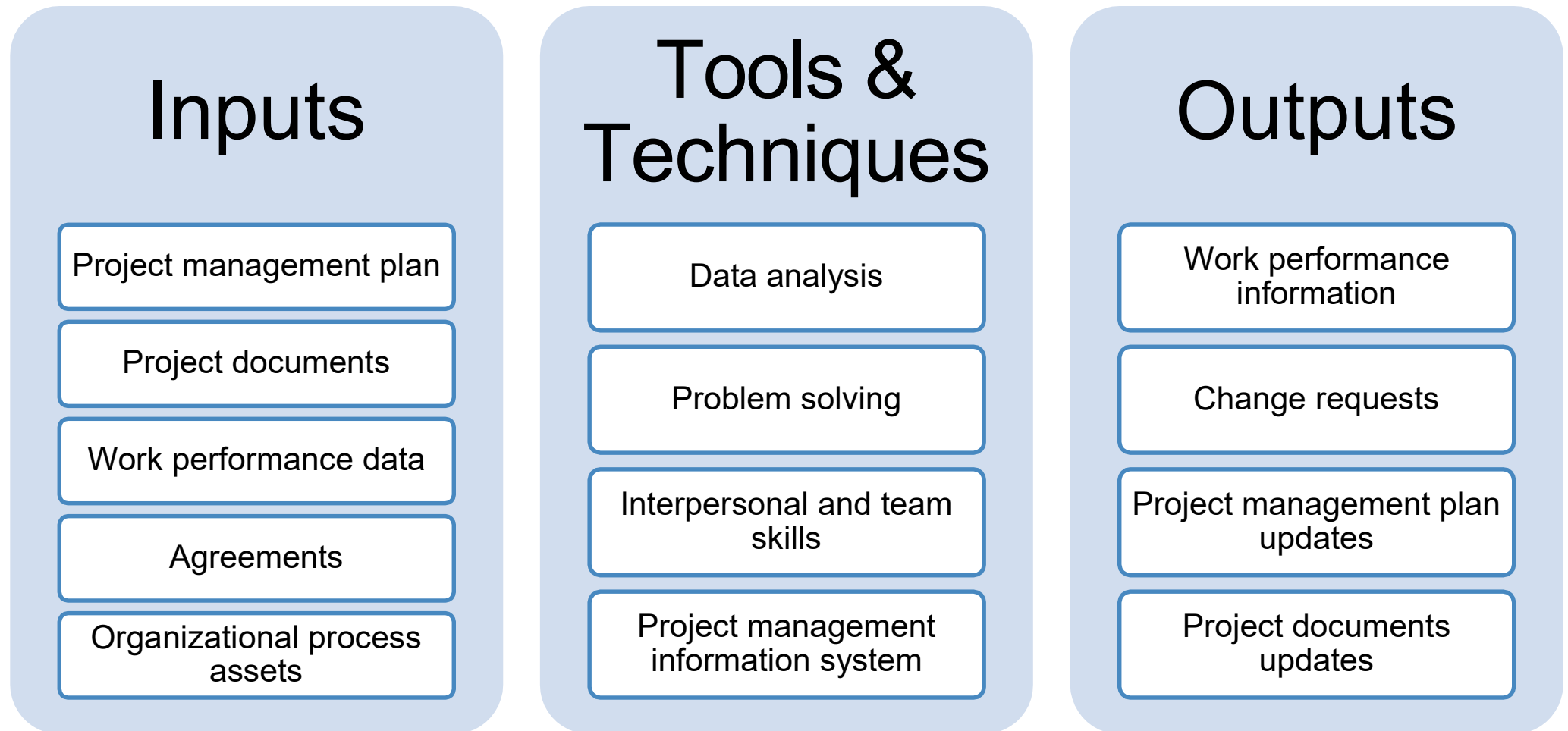
* Source: Jehn, K.A. 1997. A qualitative analysis of conflict types and dimensions in organizational groups. Administrative Science Quarterly, 42(3): 530-557.

Control Resources

- * Control Resource is the process of ensuring project resources are assigned and performing as planned. If necessary, corrective actions can be taken to maintain project progress.
- One of the common problems is the mismatch between demand required by the project and the supply of resources. For human resources in particular, this can create an unhealthy project environment when resources are overloaded.
- Project managers can manage resource overload by identifying the resources that are overloaded and either obtain more resources or distribute the work. Some specific methods of resolving overloads include:
 - Reorder project activities
 - Acquire or transition existing resources to assist
 - Reduce activity and project scope
 - Extend or change the project schedule
- When the resource mismatch are significant, then it's important to work with sponsors and address the problems early on.

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PMBOK 9.6: Control Resources



Resource Leveling

- This is a technique in which start and finish dates are adjusted based upon resource constraints with the goal of balancing demand for resources with the available Supply.
- Project managers can also shift resources from non-critical path activities to work on the critical path activities.
 - While this may work in some situations, it may not work in other situations because the skills required for certain activities can be rare and difficult to train.
- Resource leveling on large projects can be difficult, and it is often part art and part science.
 - Project managers should work with their sponsor, PMO managers, program and portfolio managers with large scale leveling.
- Any changes in resources should also be managed formally as apart of the change control process.