Project Management Fundamentals

Northeast Gas Association

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The Project

- **What is a Project?**
  - A **temporary**, **non-routine** endeavor to create a **unique** product or service limited by time, budget, and specifications.
  - The purpose of a project is to achieve its **objectives** and **transfer** to operations.
- **How does it differ from Operations?**
  - Operations are **on-going**, **permanent**, and **repetitive**.
  - The purpose of operations is to **sustain** or **maintain** the business.

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Project Life Cycle

- **Project Phases** - Used to improve management control and to reduce the degree of uncertainty.
  - Also known as stages.
  - Phase end reviews (phase gates, stage gates, kill points)
- Project phase to phase relationships can be:
  - Sequential (one phase after another – low risk)
  - Overlapping (a phase may start before the end of the previous phase – fast tracking)
  - Iterative (cyclic incremental development – agile)
- Collection of project phases are known as the **Project Life Cycle**.
  - Project life cycle serves to define the beginning and end of a project.

Project Life Cycle
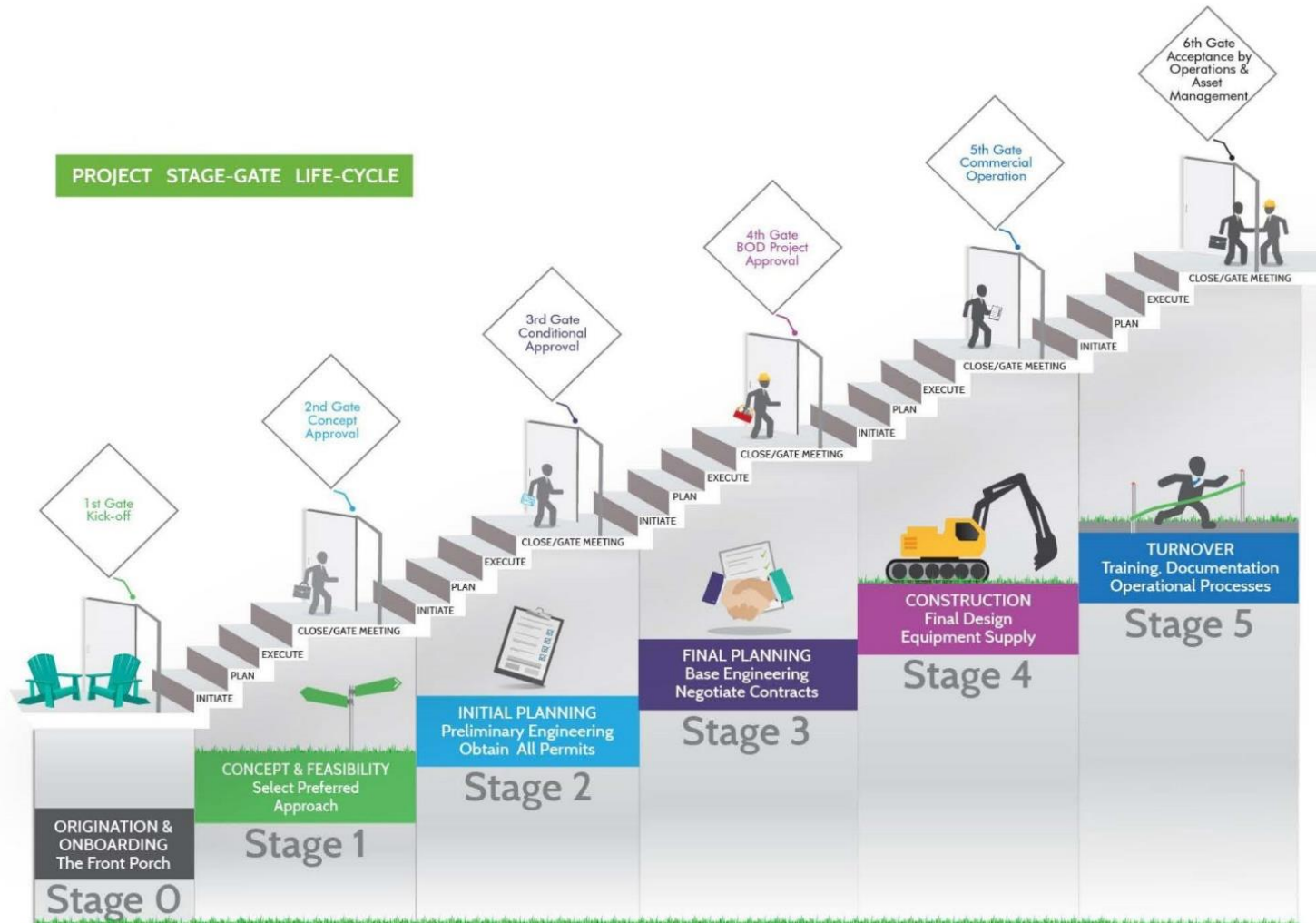
Project Management

- **What is Project Management?**
  - The application of <u>knowledge</u>, <u>skills</u>, <u>tools</u>, and <u>techniques</u> to <u>project activities</u> to meet <u>project requirements</u>.

Project Management

- **Knowledge/Skills** – experience & training
- **Tools/Techniques** – used to more efficiently manage the project
- **Project Activities** – the work
- **Project Requirements** – project goals & objectives (what is the expected end result)

Project Management

- **Managing a project includes:**
  - Identifying requirements;
  - Establishing clear & achievable objectives;
  - Balancing the competing demands for quality, scope, time and cost; and
  - Adapting the specifications, plans, and approach to the different concerns and expectations of the various stakeholders.

Competing Demands of a Project

Triple Constraint Law

Scope

Schedule

Cost
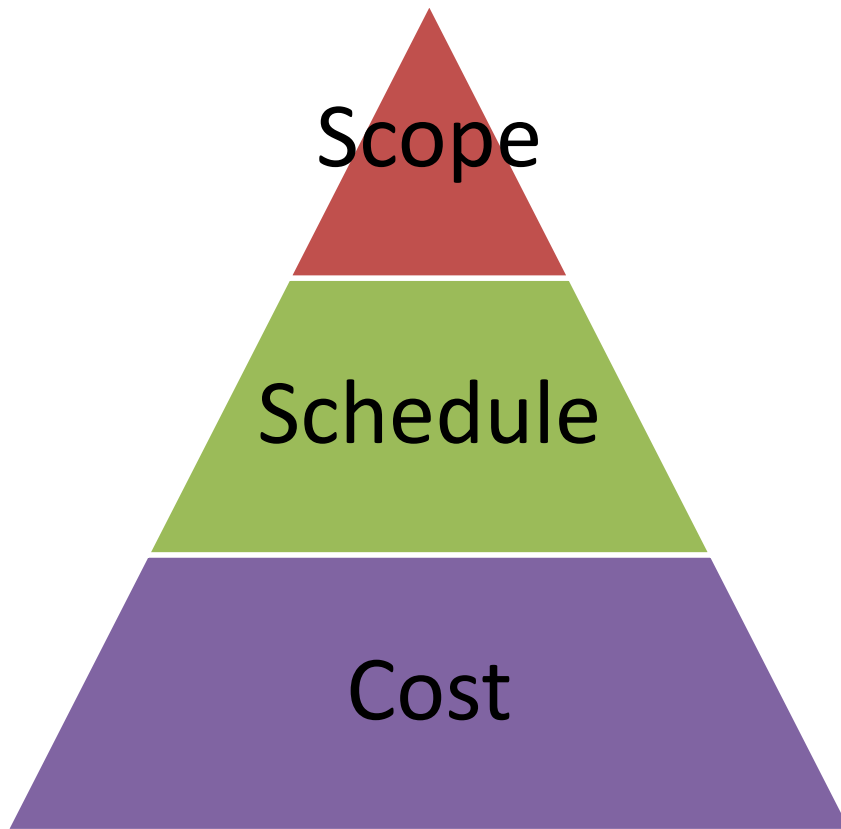
Quadruple Constraint Law

Scope

Quality

Schedule

Cost

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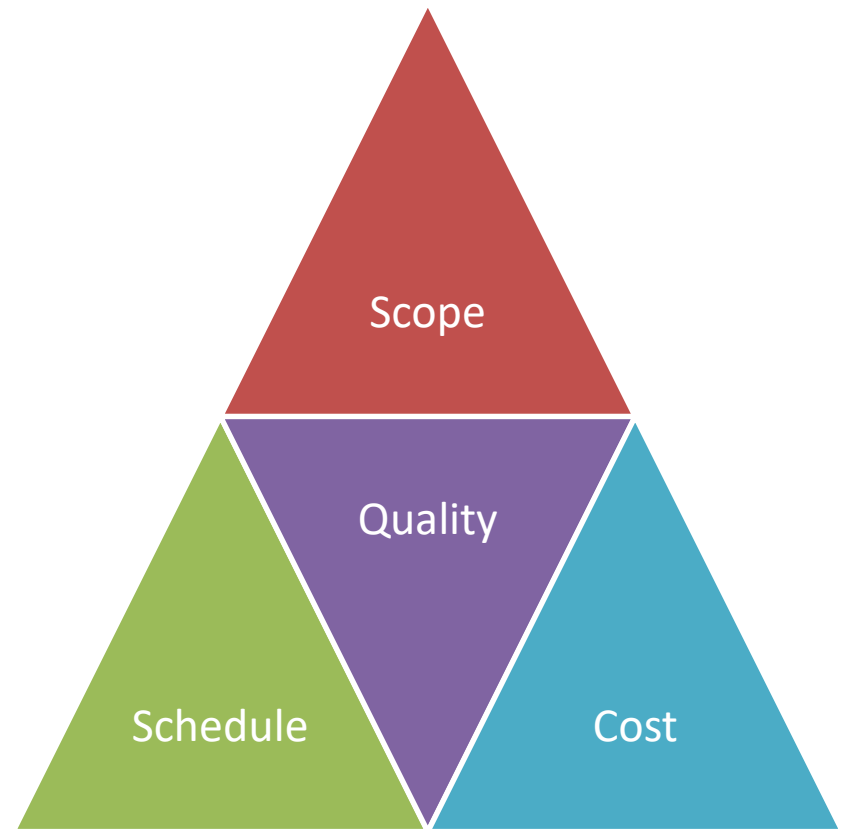
Project Management

- **Progressive Elaboration**
  - Iterative process of continuously improving and detailing the project management plan as greater amount of information becomes available.
  - Rolling wave planning.

Program vs. Portfolio Management

- ## Program Management
  - A group of **related projects** managed in a **coordinated** way to obtain benefits and control not available from managing them individually.
  - Program and project management focuses on doing programs and projects the "right" way.

- ## Portfolio Management
  - A collection of **projects and/or programs** and other work that are grouped together to facilitate effective management of that work to meet **strategic business objectives**.
  - Portfolio management focuses on doing the "right" programs and projects.

The Project Team

Project Sponsor

Provides financial resources & champions the project through the organization.

Often is the originator of the project & sets the project requirements.

Project Manager

Has overall responsibility to achieve the project objective(s).

Facilitates the creation of the PM plan.

Organizes & integrates the resources to the work tasks.

Tracks & controls the work within authorizations.

Project Management Team

Reports to the Project Manager.

Assists in the creation of the PM Plan.

Often supervises major work activities.

Assists the PM in tracking & controlling the work.

Stakeholders

Have an interest in the project & may be directly or indirectly impacted by the work.

Should be consulted as the PM plan is developed.

Includes internal & external individuals or groups.

The Project Team
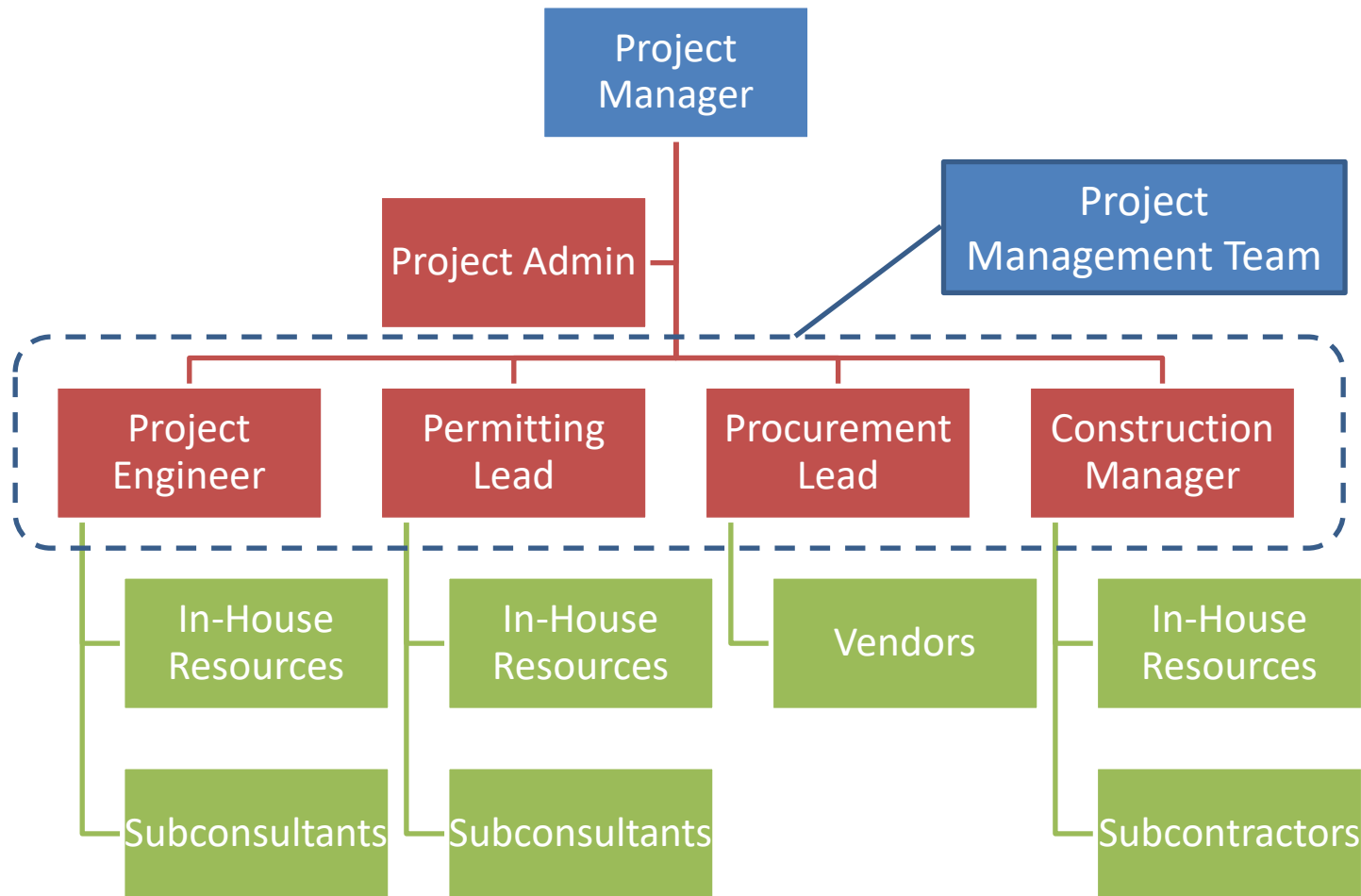
Dimensions of a Successful PM

PMI Talent Triangle

Technical Project Management

Leadership

Strategic and Business Management

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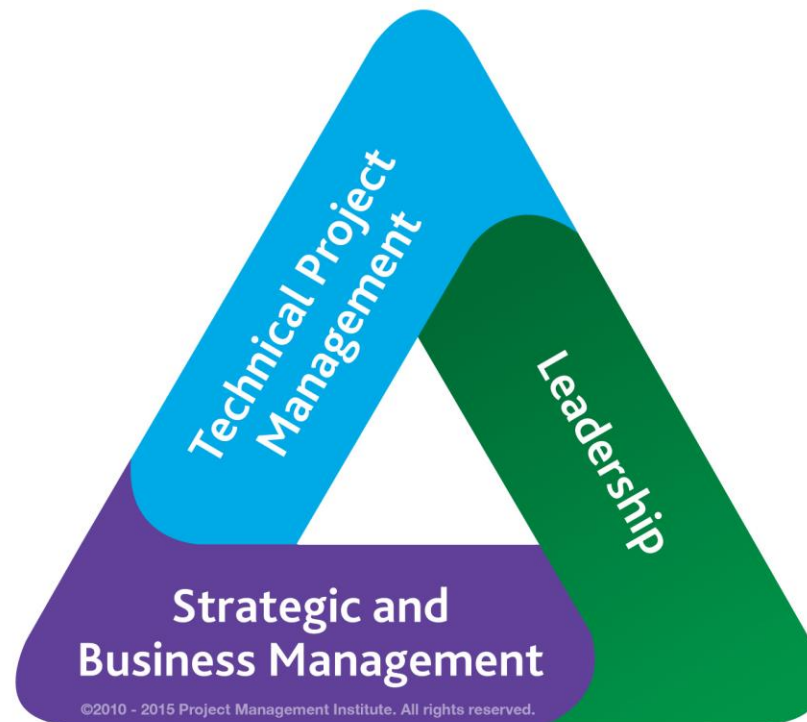
Dimensions of a Successful PM

Technical Skills	Leadership Skills	Strategic & Business Skills
• Planning • Scope of Work • Cost Estimating • Scheduling • Reporting • Risk Management	• Negotiation • Resilience • Communication • Problem Solving • Critical Thinking • Interpersonal Skills	• Domain Knowledge • Strategic Alignment • Maximize Value • Political Environment • Product/Service & Industry Expertise

Organizational Differences

- **Functional Organization**
  - An organizational structure in which projects are performed within a functional group and the functional manager directs the work and assigns priorities.

- **Matrix Organization**
  - An organizational structure in which the project manager shares responsibilities with the functional managers for assigning priorities and for directing the work of persons assigned to the project.

- **Project Organization**
  - An organizational structure in which core work is accomplished by project teams.

Types of Matrix Organizations

- **Weak Matrix**
  - Project Manager has limited authority & is assigned to oversee the cross functional aspects of a project.
  - Functional managers maintain control over their resources & project areas.
- **Balanced Matrix**
  - Project Manager is assigned to oversee the project.
  - Power is shared equally between the PM & functional managers.
- **Strong Matrix**
  - Project Manager is primarily responsible for the project.
  - Functional managers provide technical expertise & assign resources as needed.

Matrix Organization
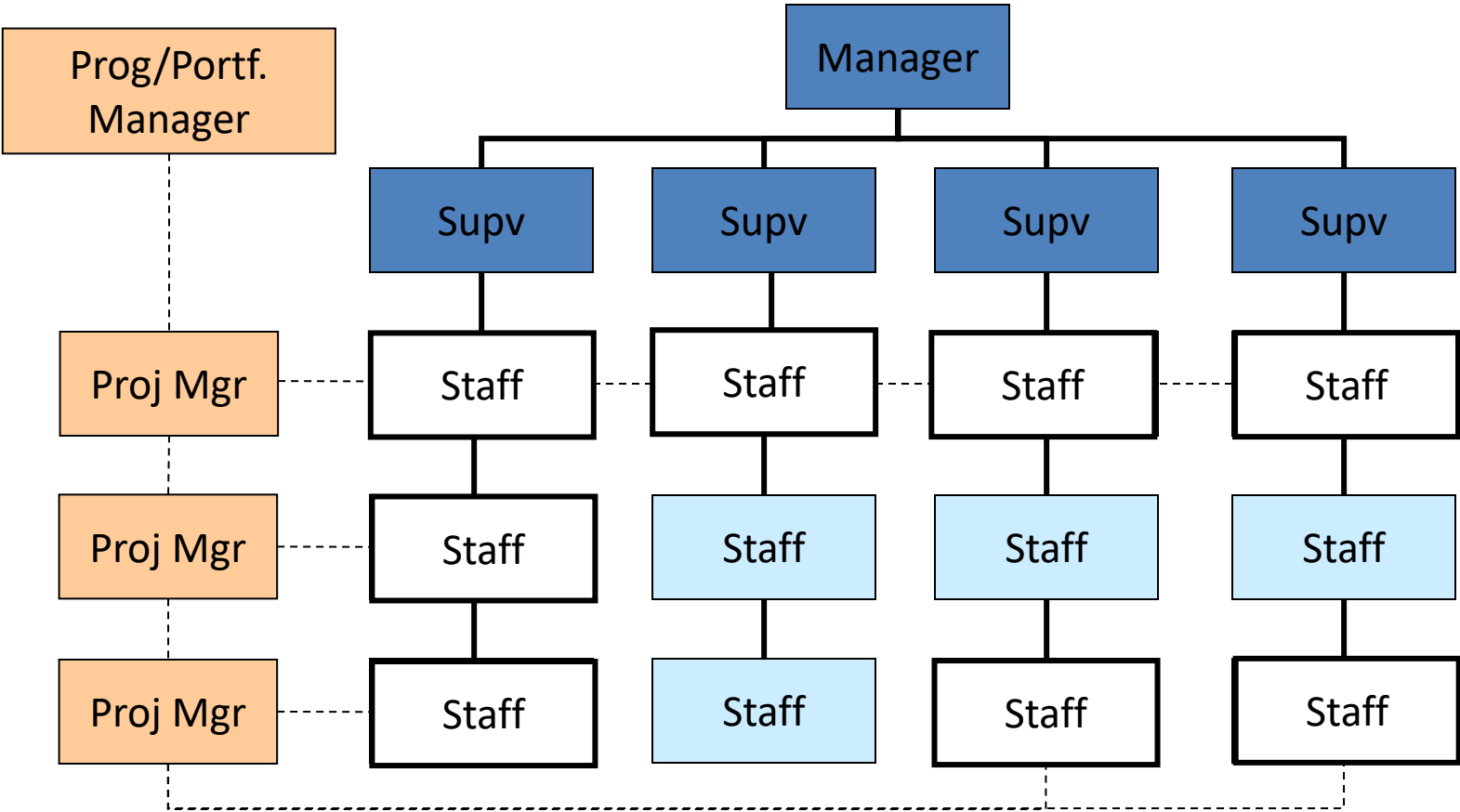
Project Management Processes

- <u>Project management life cycle</u> is managed by executing a series of project management activities known as **project management processes**.

- Processes may contain **overlapping activities** that occur through the project.

- Project management processes are divided into **five process groups** that are independent of project phases.

PM Process Groups

Monitoring & Control
- Track, review and regulate the progress.

Initiating
- Define a new project or phase.

Planning
- Establish total scope & develop a course of action.

Executing
- Complete work defined in the PM plan.

Closing
- Formally complete a project or phase.

PM Knowledge Areas

1. ***Integration Management*** – identify, define, unify & coordinate activities.
2. ***Scope Management*** – include all the work and only the work required.
3. ***Schedule Management*** – timely completion of the project.
4. ***Cost Management*** – complete the project within approved budget.
5. ***Quality Management*** – satisfy needs for which the project was undertaken.
6. ***Resource Management*** – organize, manage and lead project team.
7. ***Communications Management*** – timely & appropriate information to stakeholders.
8. ***Risk Management*** – maximize opportunities and minimize threats.
9. ***Procurement Management*** – purchase or acquire products & services needed from outside.
10. ***Stakeholder Management*** – engage stakeholders in decisions based on their needs, interests and potential impact.

Project Phase & PM Process Group Relationships

	Monitoring & Control			
PM Process Groups	Initiating	Planning	Executing	Closing
Project Phase A	Task 1	Task 2	Task 3	Task 4	Task 5
Project Phase B	Task 1	Task 2	Task 3
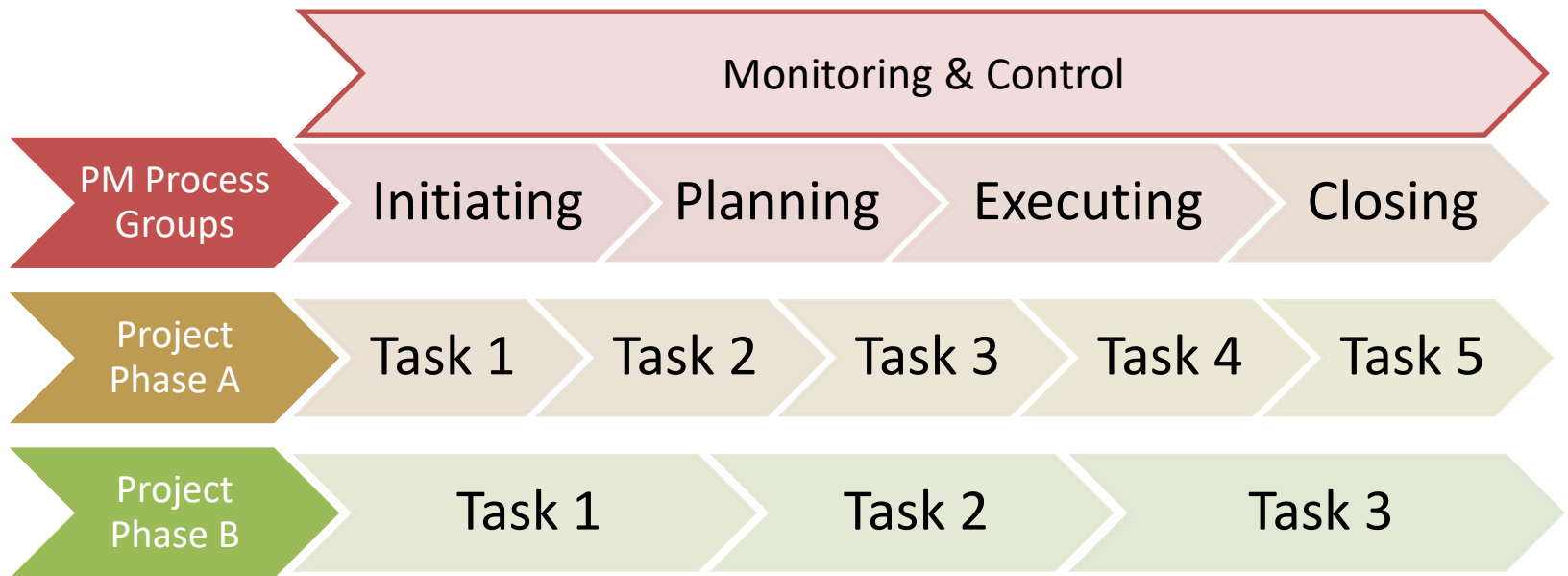
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Project Phase & PM Process Group Relationships
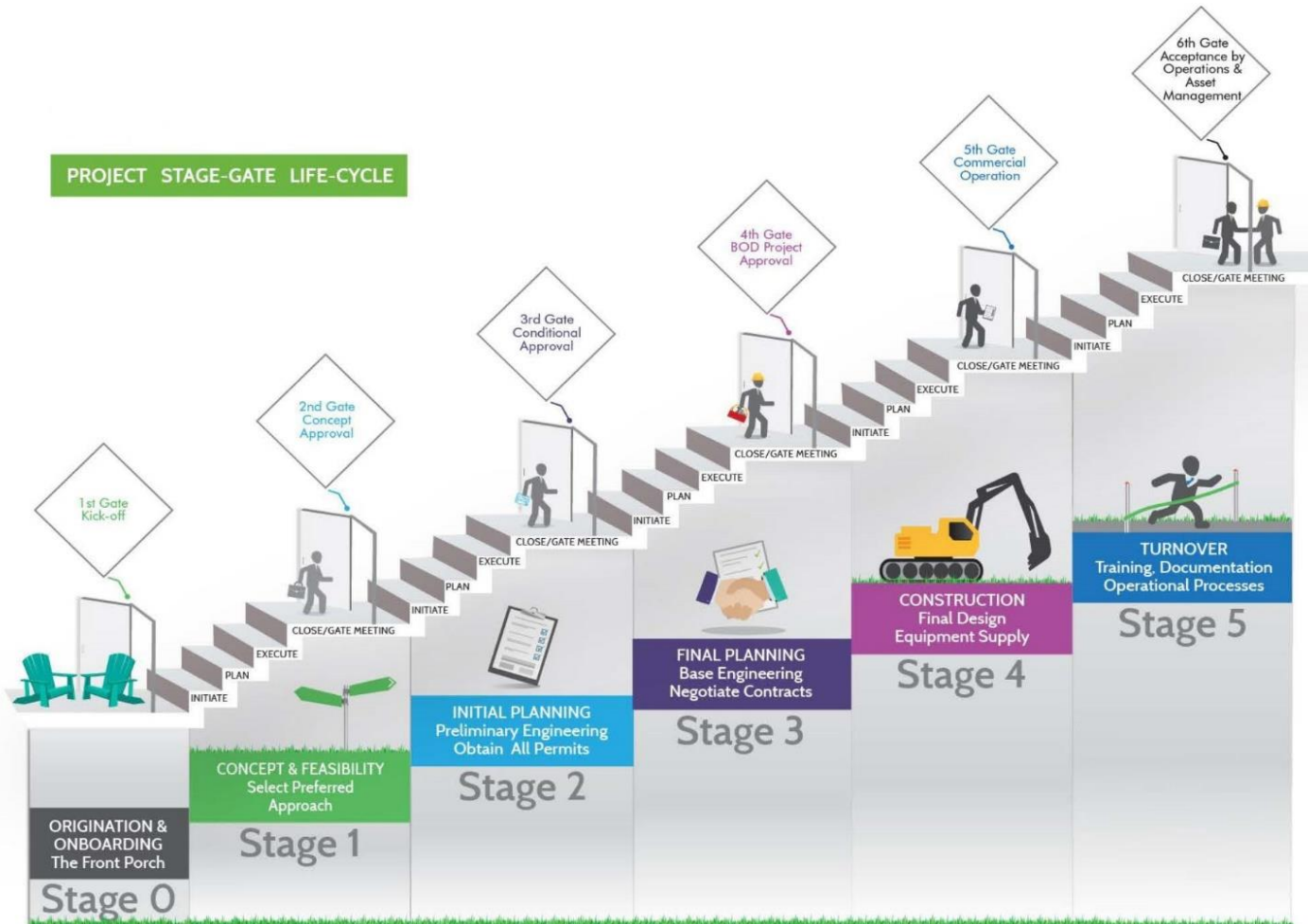
Example Project Management Activities

Weston & Sampson Approach

PM Life Cycle

- Client Relationships
- Strategies
- Proposals

- Scope
- Schedule
- Budget
- Staffing
- Agreements

Initiation

Planning

Monitoring & Control

Closeout

Execution

- Client Satisfaction
- Lessons Learned
- Administrative Closeout

- Communication
- Collaboration
- Teamwork
- Quality
- Attention to Detail

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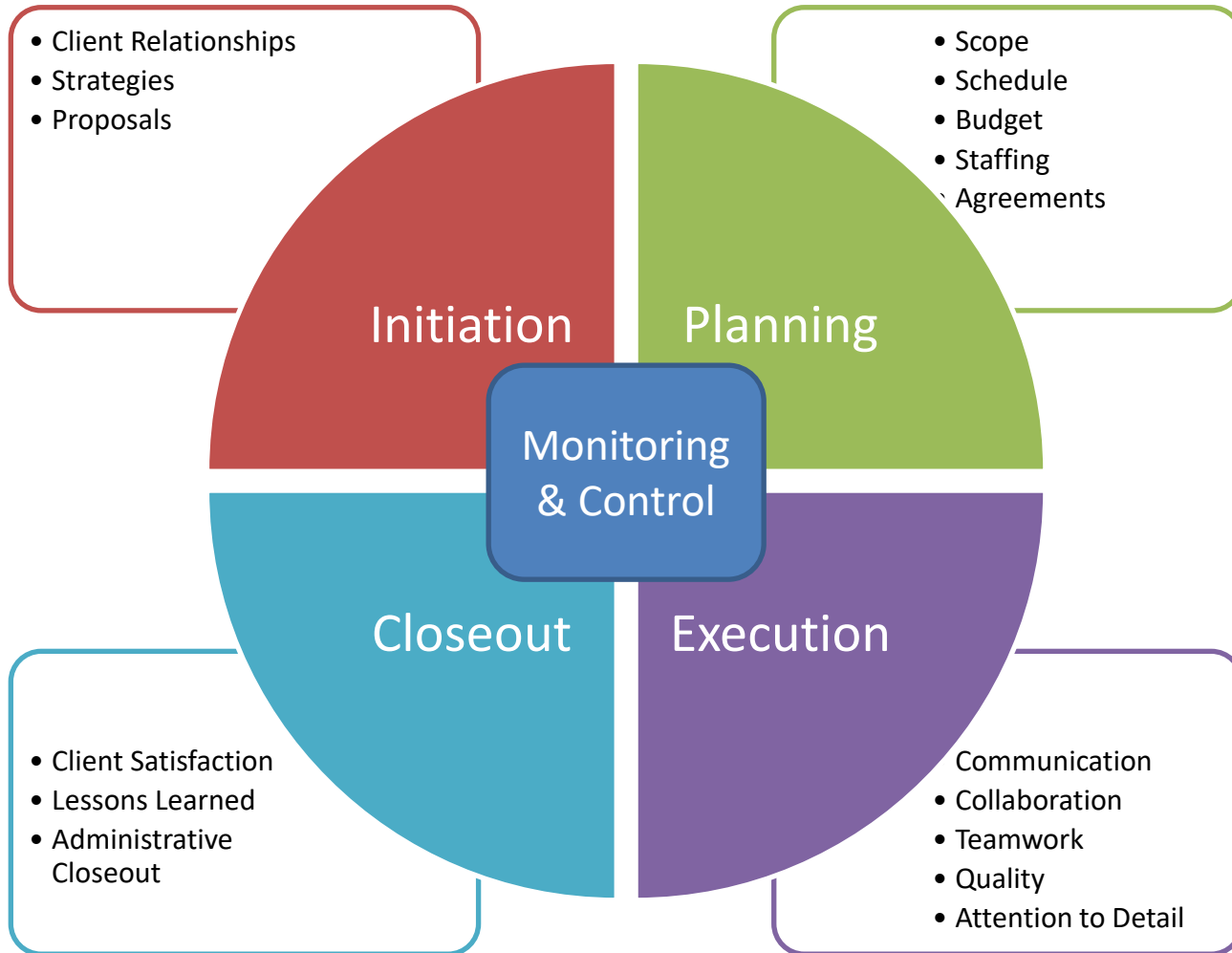
Initiation (Development)

- Client Relationships
  - Build trust with clients.
  - Find out about client needs.
  - Meet with client to understand their needs.
  - Collaborate and consider how to best address the needs.

- Strategies
  - Meet with client to discuss approach, scope, schedule and client's budget.
  - Consider the competition and strategize how to win.
  - Consider the client's selection procedure.

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Initiation (Development)

- Proposals
  - Estimate the project's cost.
  - Meet with in-house staff and subconsultants to negotiate scope, schedule and fee.
  - Prepare and submit proposal (or agreement).

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Planning

- Receive notification that we are selected!
- Meet with client to review scope, schedule, fee and billing terms (proposal).
- Plan how to conduct the project.
- Meet with in-house staff to finalize the scope, schedule and fee.
- Prepare and negotiate a written agreement with client.
- Receive signed written agreement from client.
- Prepare and obtain signed subconsultant agreement(s).
- Establish budgets for project team members.
- Establish milestone schedule.
- Submit a Project Description Form to Accounting to open a project number.

Work Breakdown Structure (WBS)

Project

Engineering & Design
- 30% Design
- 60% Design
- 90% Design
- IFC Drawings

Procurement
- Equipment & Material Specs
- Major/Long Lead Materials
- Balance of Materials

Prefabrication
- Skids
- Pipe Spools & Rack

Construction
- Planning
- Civil Site Work
- Foundations Installation
- Piping & Mechanical Work
- Electrical & Instrumentation Work

Startup & Commissioning
- Loop & Operational Checks
- Performance Testing
- Operator Training

Turnover
- As-Built Drawings
- Final Project Documentation

Project Schedule

ID	Task Name	Start	Finish	Duration	2018				2019				2020	
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
1	**Rocky Mount LNG Project**	1/1/2018	1/19/2020	107w									Rocky Mount LNG Project	
2	Project Award/Kickoff	1/1/2018	1/1/2018	0w	Project Award/Kickoff									
3	Project Planning	1/1/2018	1/26/2018	4w	Project Planning									
4	**Engineering & Design**	1/29/2018	1/11/2019	50w				Engineering & Design						
5	30% Design	1/29/2018	4/20/2018	12w	30% Design									
6	60% Design	4/23/2018	7/27/2018	14w		60% Design								
7	90% Design	7/30/2018	11/16/2018	16w			90% Design							
8	Issued for Construction	11/19/2018	1/11/2019	8w				Issued for Construction						
9	**Procurement**	1/29/2018	6/28/2019	74w					Procurement					
10	Praxair Liquefier	1/29/2018	3/22/2019	60w				Praxair Liquefier						
11	Pretreatment System	4/23/2018	4/19/2019	52w				Pretreatment System						
12	LNG Storage Tanks	4/23/2018	3/8/2019	46w				LNG Storage Tanks						
13	LNG Vaporizer	4/23/2018	2/22/2019	44w				LNG Vaporizer						
14	LNG Pump	4/23/2018	9/7/2018	20w			LNG Pump							
15	Materials for Skids & Prefabrication	7/30/2018	12/14/2018	20w				Materials for Skids & Prefabrication						
16	BOP Piping & Mech. Materials	1/14/2019	6/28/2019	24w					BOP Piping & Mech. Materials					
17	BOP Electrical Materials	1/14/2019	5/3/2019	16w					BOP Electrical Materials					
18	SCADA & Controls Equipment	1/14/2019	5/3/2019	16w					SCADA & Controls Equipment					
19	**Prefabrication**	12/17/2018	3/8/2019	12w					Prefabrication					
20	Meter Skids	12/17/2018	2/8/2019	8w					Meter Skids					
21	LNG Pump Skid	12/17/2018	2/22/2019	10w					LNG Pump Skid					
22	LNG Truck Loading Skid	12/17/2018	3/8/2019	12w					LNG Truck Loading Skid					
23	Piping Spools & Pipe Racks	12/17/2018	3/8/2019	12w					Piping Spools & Pipe Racks					
24	**Construction**	11/19/2018	11/22/2019	53w								Construction		
25	Construction Planning	11/19/2018	3/1/2019	15w					Construction Planning					
26	Site Clearing & Grubbing	3/4/2019	3/29/2019	4w					Site Clearing & Grubbing					
27	Site Rough Grading	4/1/2019	4/26/2019	4w					Site Rough Grading					
28	Foundations Installation	4/29/2019	6/21/2019	8w						Foundations Installation				
29	Set Major Equipment	6/24/2019	7/5/2019	2w						Set Major Equipment				
30	Mechanical & Piping Work	7/8/2019	9/27/2019	12w							Mechanical & Piping Work			
31	Electrical Work	6/24/2019	10/11/2019	16w							Electrical Work			
32	SCADA & Controls Work	9/30/2019	11/22/2019	8w								SCADA & Controls Work		
33	Finish Grading & Cleanup	10/14/2019	11/8/2019	4w								Finish Grading & Cleanup		
34	**Startup & Commissioning**	10/14/2019	12/20/2019	10w								Startup & Commissioning		
35	Loop Checks	10/14/2019	11/8/2019	4w								Loop Checks		
36	Operational Checks	11/25/2019	12/6/2019	2w								Operational Checks		
37	Performance Testing	12/9/2019	12/20/2019	2w								Performance Testing		
38	Operator Training	12/9/2019	12/20/2019	2w								Operator Training		
39	**Turnover**	12/23/2019	1/20/2020	4w								Turnover		
40	Final Project Documentation	12/23/2019	1/17/2020	4w								Final Project Documentation		
41	Project Final Completion	1/20/2020	1/20/2020	0w								Project Final Completion		

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Execution

- Hold a kick-off meeting with the project team.

- <u>Communicate</u> and coordinate with client, staff, regulatory agencies, and subconsultants.

- Meet with project team to assure progress and adherence to quality, schedule and budget.

- <u>Communicate</u> often with client and principal-in-charge to keep informed, build trust, and respond quickly.

- Coordinate TRC of work prior to delivering it to the client.

- Deliver work to client with excellence, on time, on budget and within scope.

Monitor & Control

- Manage the assignments based on scope, schedule and budget.

- Take actions to stay on course.

- Be alert to detect and avoid scope creep.

- Review and approve monthly pre-bills and final invoices.

- Prepare and submit monthly ETCs.

Closeout

- Check with client to make sure they are satisfied.

- Organize project files.

- Hold a lessons learned meeting with the project team.

- Release project resources.

- Close the project with Accounting.

CONCLUSION

- Project Management is **scalable** and **adaptable**.
  - It should be tailored to the needs of your company, project (client) and project team.

- **Simpler** is usually better.
  - Don't establish overcomplicated processes and procedures.

- Remember that project management is <u>not</u> the end goal, but instead a means to accomplish the project goals and in return help a company to achieve success and deliver on its promises.

References & Resources

- Project Management Body of Knowledge (PMBOK), Project Management Institute. Newton Square, PA. www.pmi.org

- ProjectManagement.com

- National Society of Professional Engineers (NSPE)

Questions?

thank you

westonandsampson.com