

Project Planning and Control Methods

Lecture #2

An Overview of Project Management Body of Knowledge

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Outline

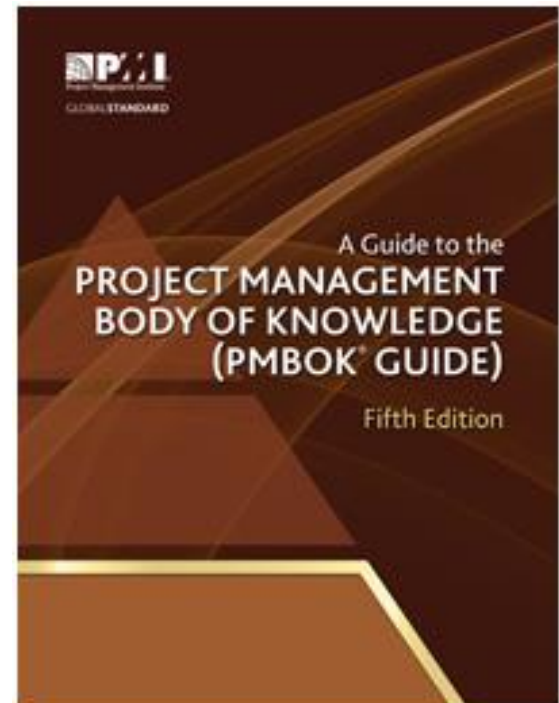
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- Introduction
- Project life cycle
- Project management processes
- Project management knowledge areas
- PM processes and knowledge areas mapping
- PMO, to address the existing complication

Introduction

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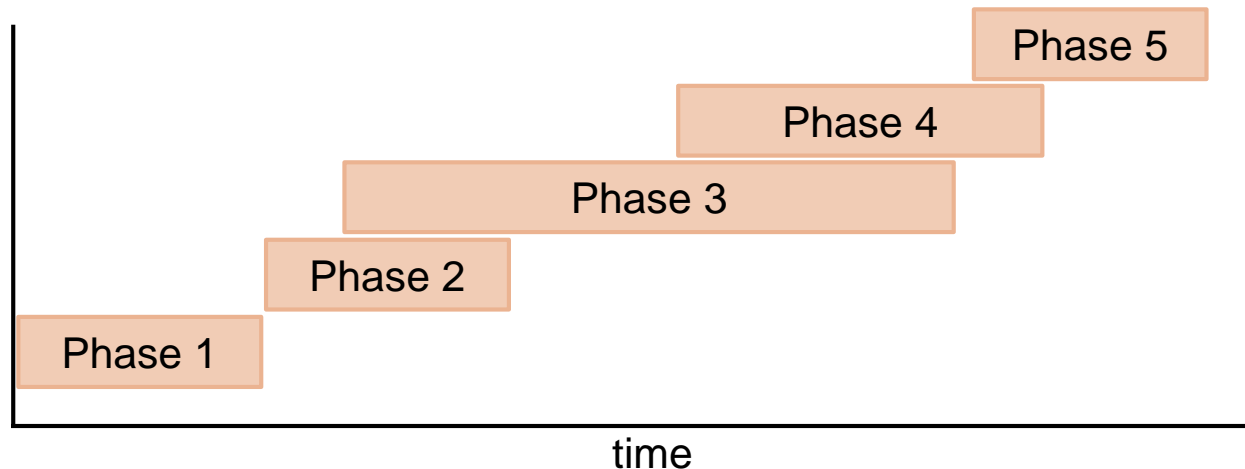
- “Project Management Body of Knowledge” (PMBOK) is the title of the project management standard published by “Project Management Institute Inc.” (PMI) and describes the project management processes, tools, and techniques used to manage a project toward a successful outcome.
- This standard is limited to single projects, i.e., does not discuss how an organization can integrate its effort when it is concurrently managing multiple projects.



Project life cycle

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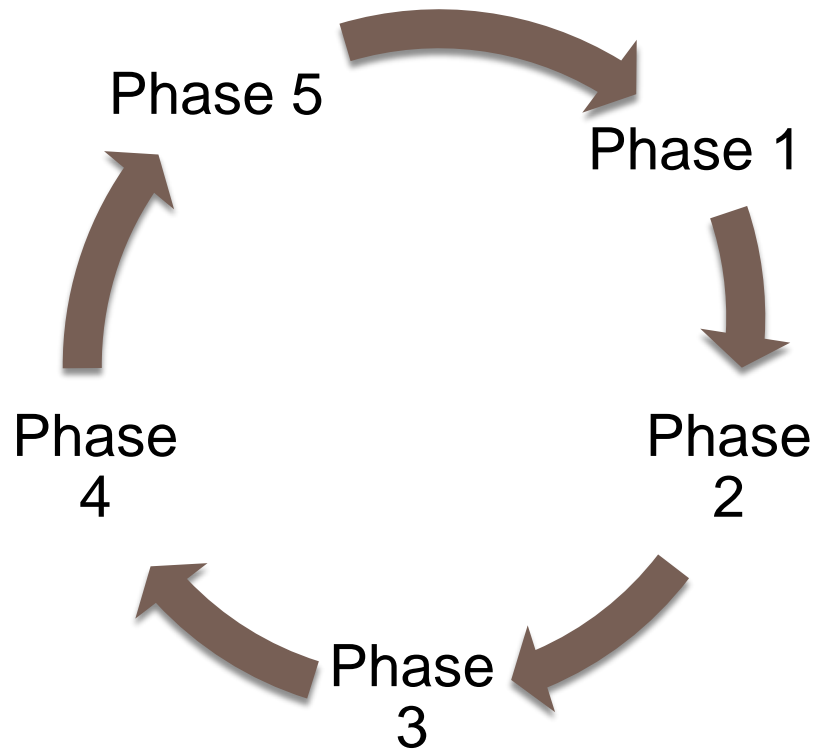
- The first step for understanding a project is to be able to recognize its **life cycle**.
- A project **life cycle** is a collection of generally *sequential* and sometimes *overlapping project phases*.
- A **project phase** is a grouping of project activities based on logic or commonalities; generally completion of **major deliverables** (or outputs) at the end of a phase is expected.



A sample project lifecycle with 5 phases on time axis

Project life cycle

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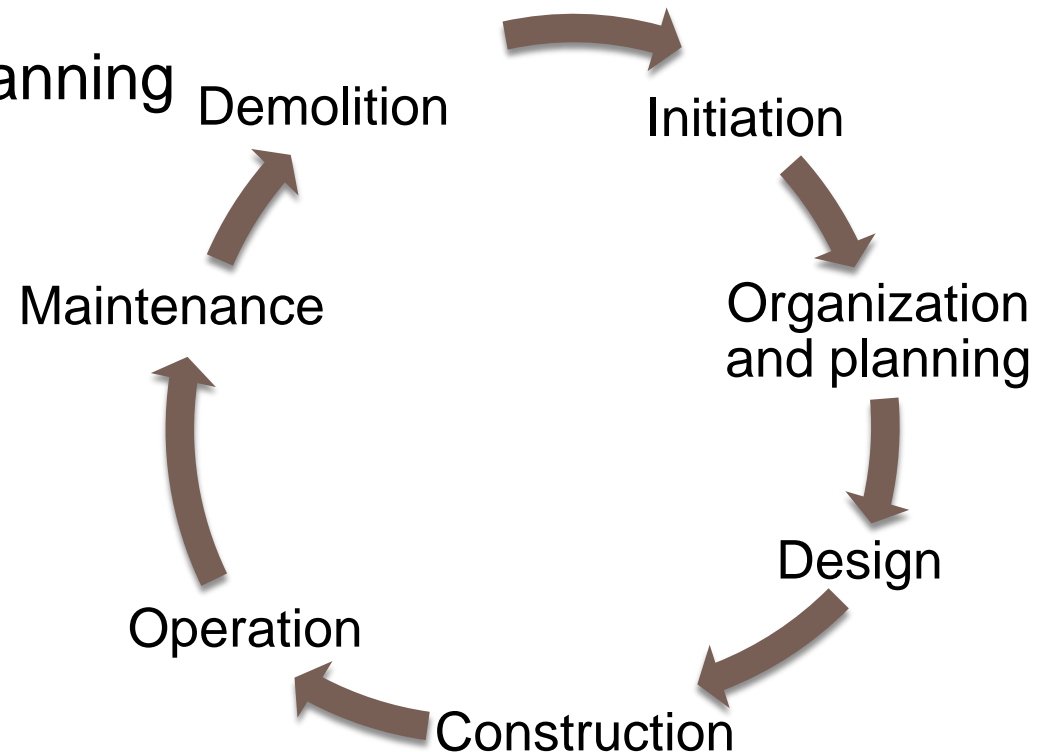
A sample project lifecycle with 5 phases on cycle form

Project life cycle

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□ Example - Typically a construction project lifecycle consists of the following phases:

- Initiation
- Organization and planning
- Design
- Construction
- Operation
- Maintenance
- Demolition

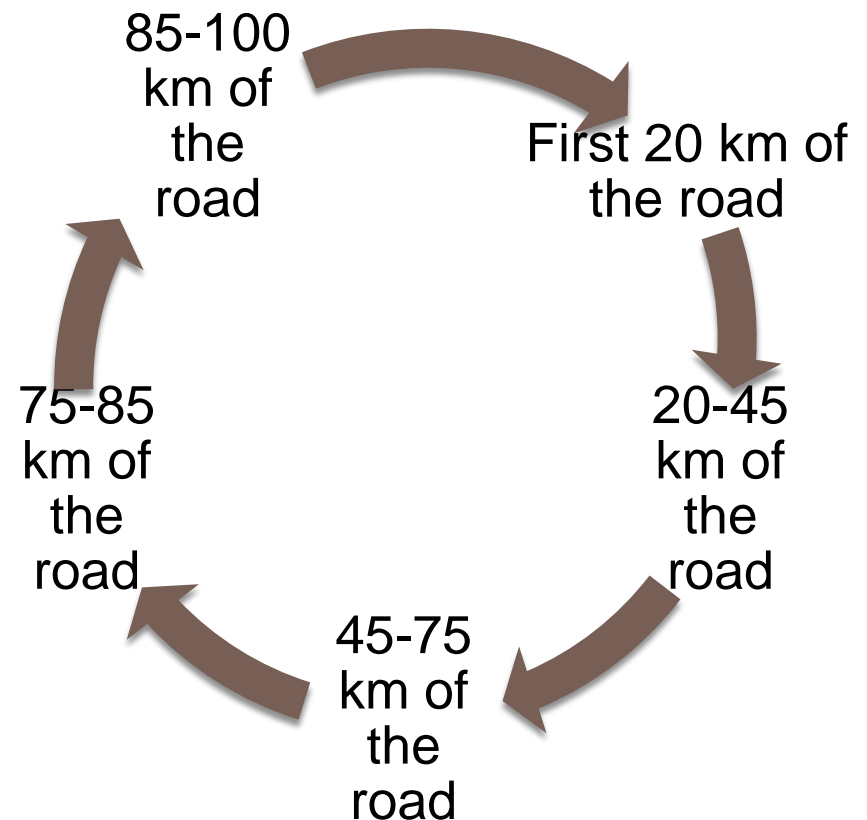


Project life cycle

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□ Example – A 100 km road construction project lifecycle might have following phases:

- First 20 km of the road
- 20-45 km of the road
- 45-75 km of the road
- 75-85 km of the road
- 85-100 km of the road

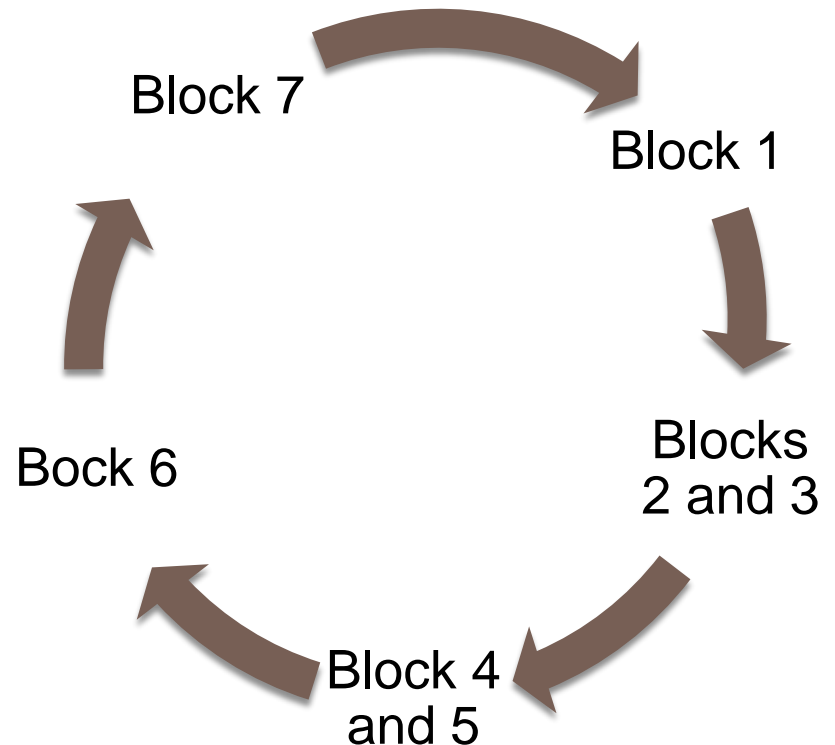


Project life cycle

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□ Example – A seven blocks residential building construction project lifecycle can be divided as in below:

- Block 1
- Blocks 2 and 3
- Block 4 and 5
- Block 6
- Block 7

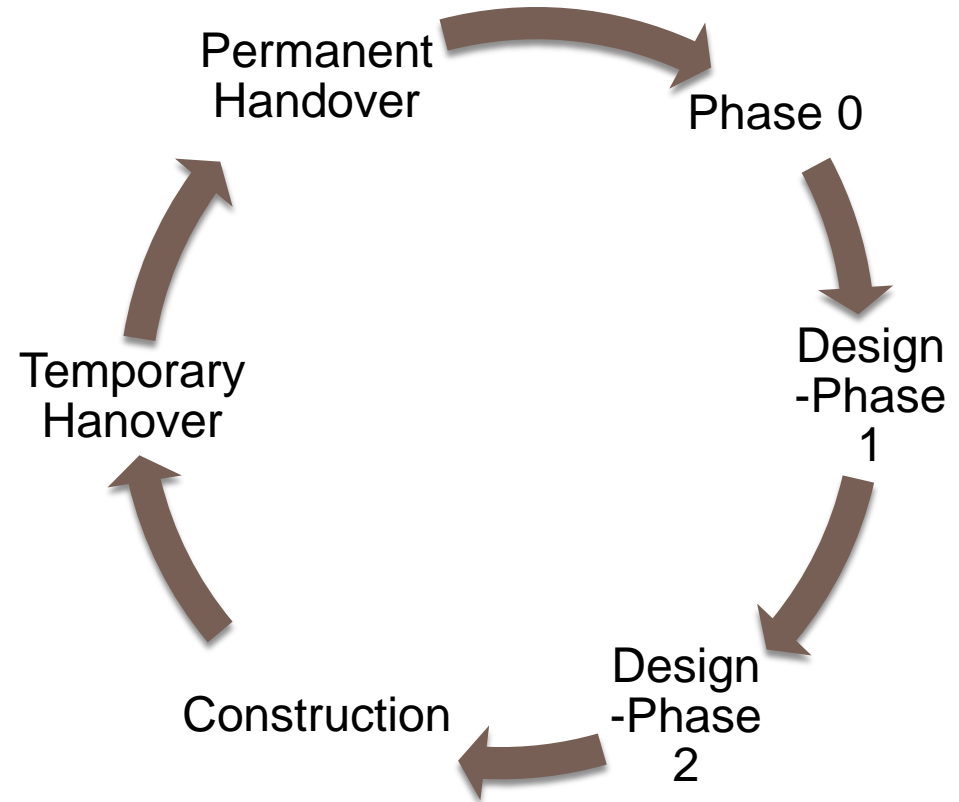


Project life cycle

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□ Example – Typical phases in public construction projects in Iran (Client's Implementation Organization view):

- Phase 0
- Design-Phase 1
- Design-Phase 2
- Construction
- Temporary Handover
- Permanent Handover



Project life cycle

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- Example-project phase deliverables:
 - A major output or deliverable of a phase 1 or construction of first 20 km of the a pipeline construction project is 20 km pipeline constructed,
 - A major output or deliverable of a design phase is the project's design drawn on drawings
 - A major output or deliverable of a planning phase is the project's plan on M.S. Project file
 - A major output or deliverable of a construction phase of a building construction project is the constructed building

In class exercise 1

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- Is this true? Project life cycle is equivalent to the project phases.
- What are typical main (high level) outputs and deliverables in a multi storey building construction project (for a construction company)? Use these deliverables to draw typical construction project main phases and a project life cycle!

In class exercise 1

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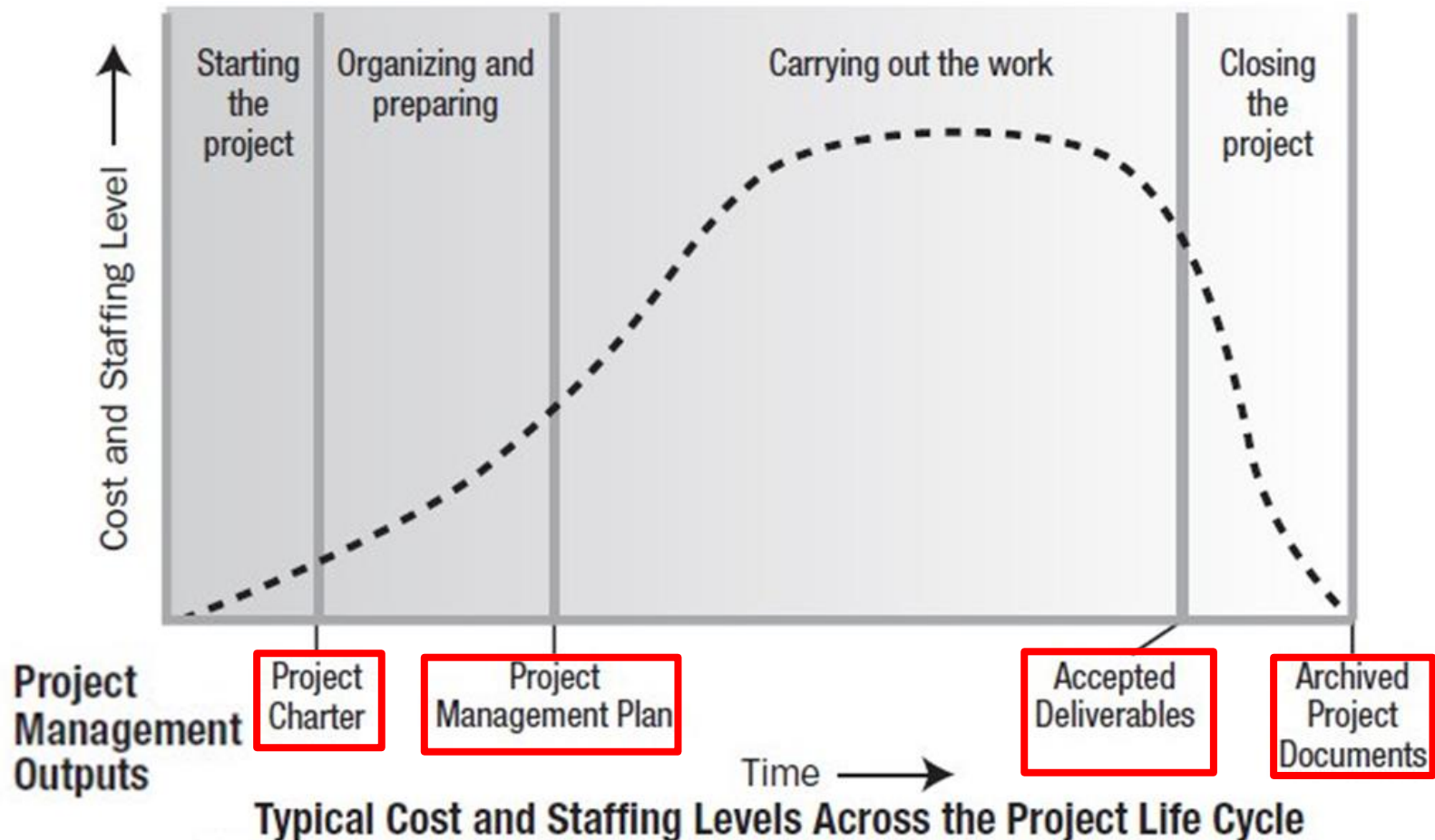
An example for life cycle can be:

-Bidding, Contracting, Construction organization and planning, Land acquisition, *Construction Permit*, Construction Mobilization, Construction Operation (Land preparation, foundation construction, structure construction, Wall and window construction, Building Finishing, Utility construction), Termination Permit, Project handover

Project life cycle

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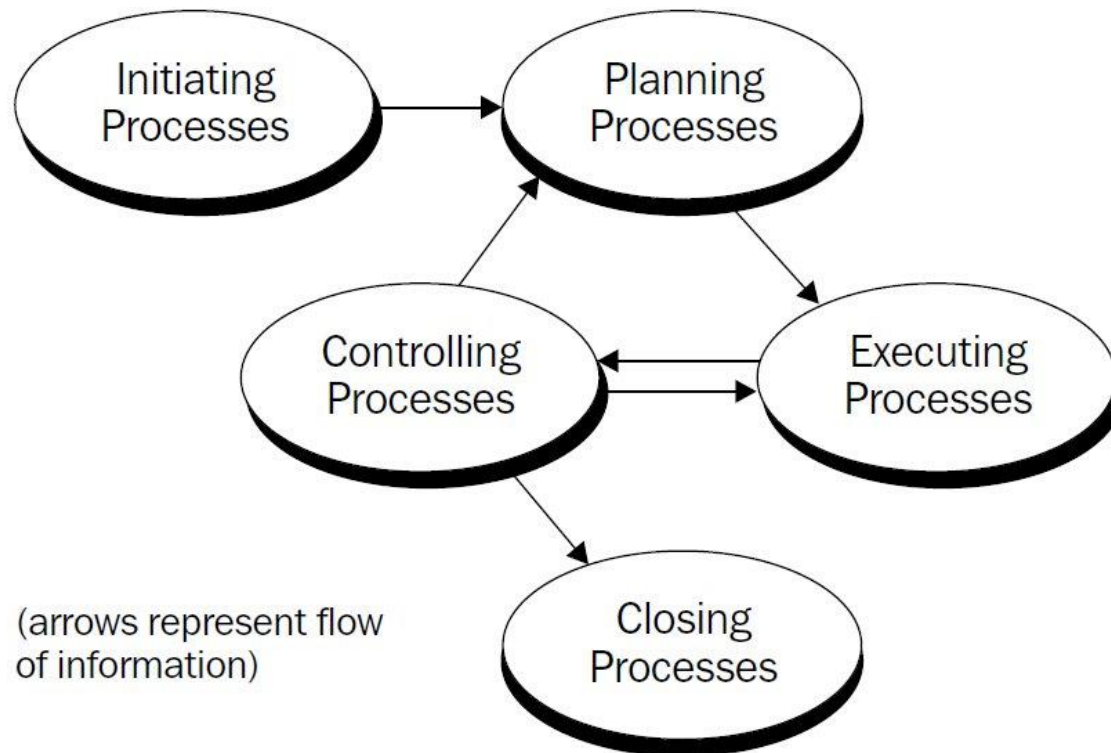
- Projects vary in size and complexity. No matter how large or complex a project is, project management life cycle can be mapped to the following structure:



Project management processes

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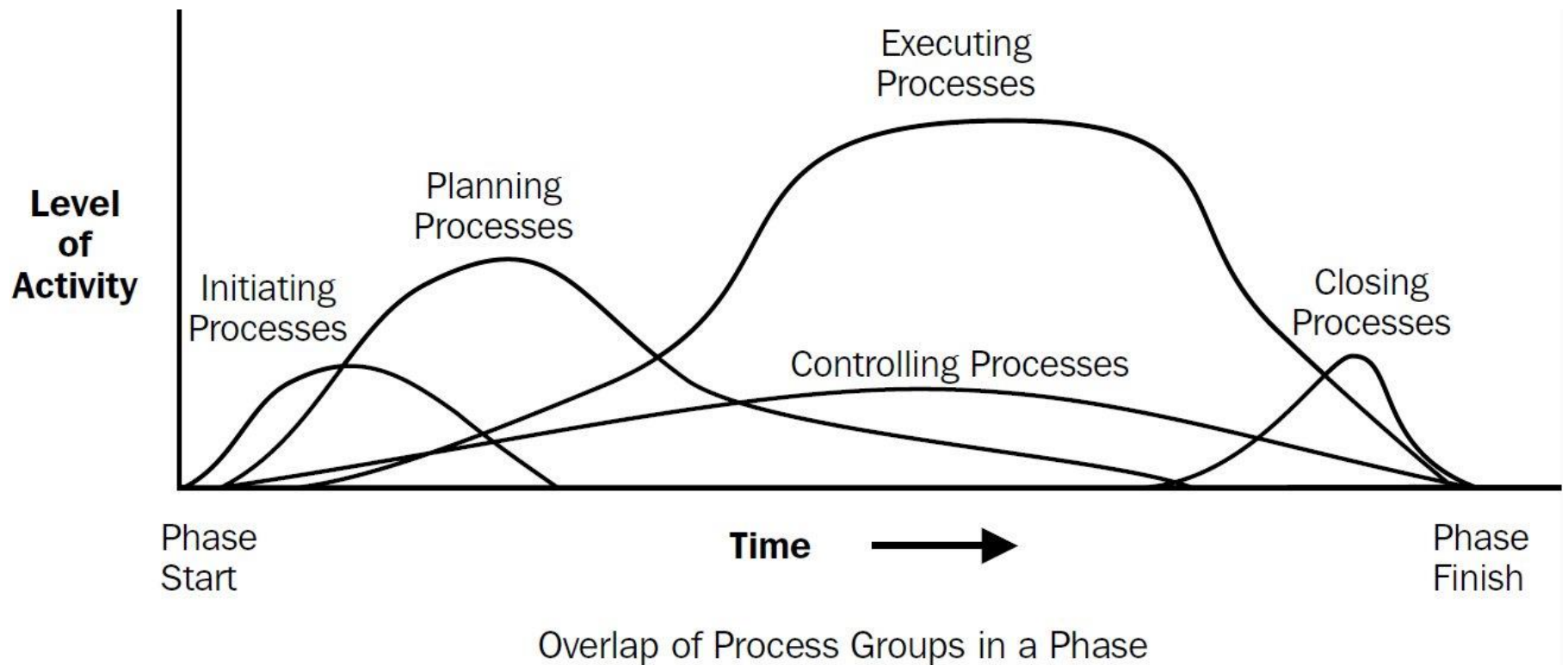
- In every project **phase**, project management processes are grouped into five categories known as Project Management **Process** Groups:



Links among Process Groups in a Phase

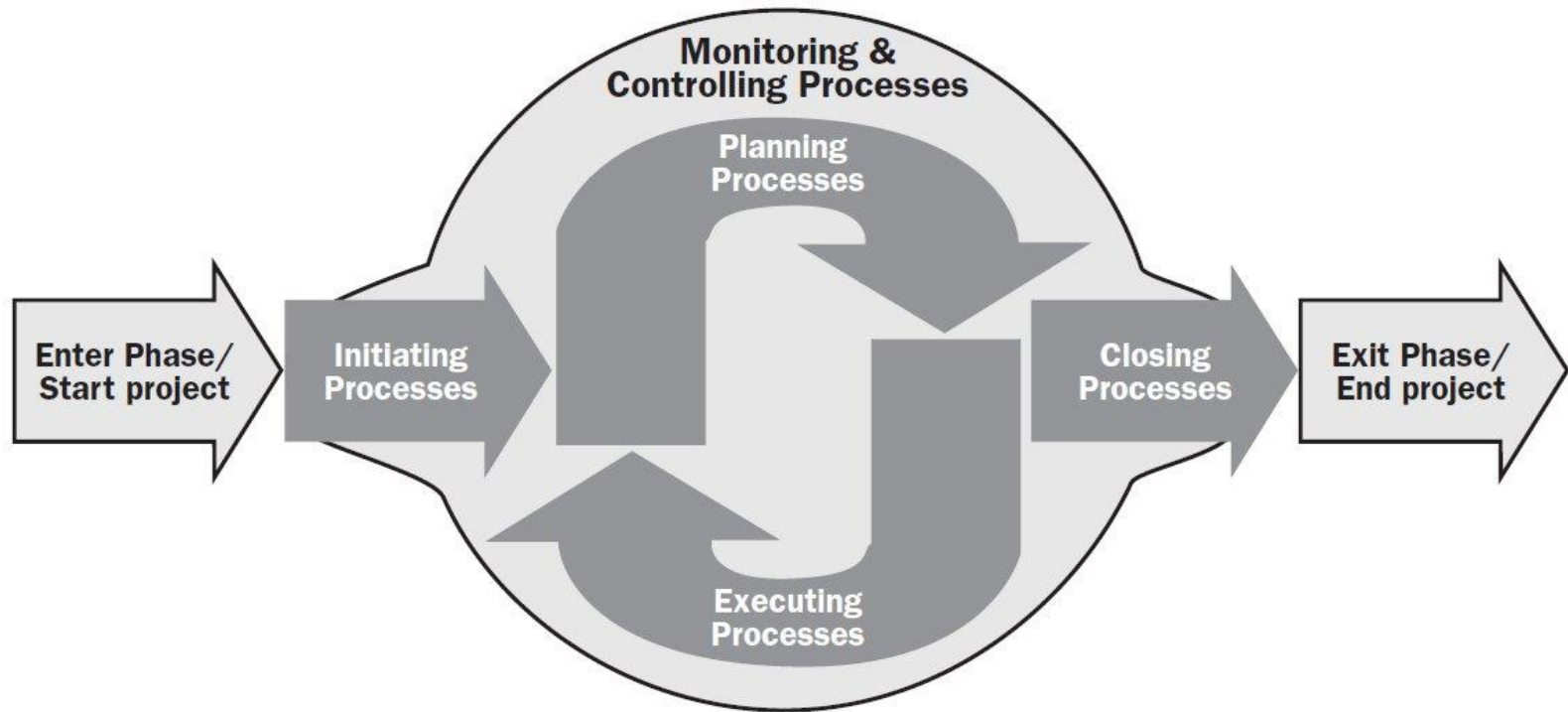
Project management processes

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Project management processes

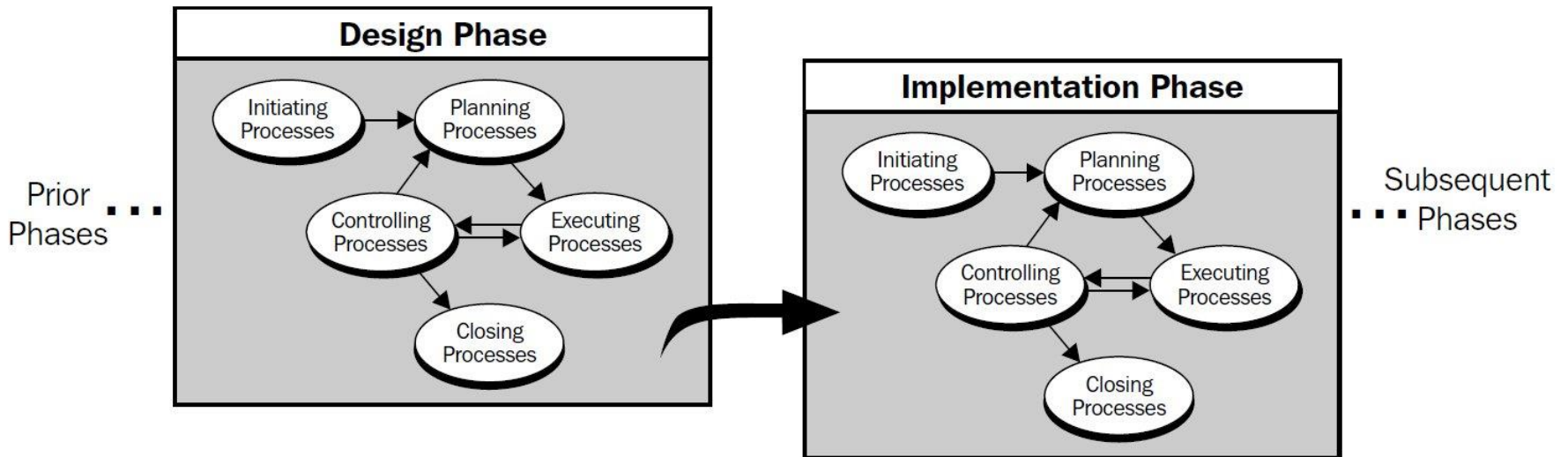
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Project Management Process Groups

Project management processes

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Interaction between Phases

- Outputs (deliverables) from one phase are used as inputs to the next phase.



Question: If outputs from one phase are used as inputs to the next phase, how does overlap between phases happen?



Question: Which one stays at the higher level of the project management: project life cycle or project management processes?

Project management knowledge areas

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- There are 10 different PM knowledge areas identified by PMI.

1) Project Integration Management

Project Integration Management includes the processes and activities needed to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups. More details about this knowledge area is discussed in Lecture 3.

2) Project Scope Management

Project Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. More details about this knowledge area is discussed in Lecture 4 and 10.

Project management knowledge areas

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3) Project Time Management

Project Time Management includes the processes required to manage timely completion of the project. More details about this knowledge area is discussed in lectures 5 to 8 and 10.

4) Project Cost Management

Project Cost Management includes the processes involved in estimating, budgeting, and controlling costs so that the project can be completed within the approved budget. More details about this knowledge area is discussed in lectures 9 and 10.

Project management knowledge areas

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5) Project Quality Management

Project Quality Management includes the processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken.

* Inspection and test plan (ITP) is a main project quality document in the construction projects. It outlines details of the inspection plan and the acceptance condition. See example [1](#), [2](#) and [3](#) (💡 which is more robust?).

* Procedure for handling nonconformities caught and trending them in the project is another major quality plan document to be prepared.

Project management knowledge areas

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6) Project Human Resource Management

Project Human Resource Management includes the processes that organize, manage, and lead the project team.

* Current organizational human resource processes and structure is the main input (See PMBOK [explanations on different types of organizational structure for project based Companies](#))

* Human resource management plan consist of human resource responsibilities and skills required is an output

* Resource performance evaluation is another output (Example [1](#) and [2](#))

* Improving human resource competencies and managing training programs are missions of project HR management area to enhance project performance

Project management knowledge areas

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7) Project Communications Management

Project Communications Management includes the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposition of project information (Example [1](#), [2](#)).

* How stakeholders (see area of knowledge number 10) are incorporated and communicated during the project, communication hierarchy, and communication tools (e.g., email, mail and portals) are some outputs

Project management knowledge areas

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8) Project Risk Management

Project Risk Management includes the processes of conducting risk planning, identification, analysis, response planning, and monitoring and control on a project.

- * Project risk assessment is an important document for the project
- * Job hazard assessment (JHA) - is completed based on the jobs to be done; field level risk assessment (FLRA) - is completed on regular (usually daily) basis to assess new changes on site and their related risks; and behavioural based observation (BBO) - is completed on regular (usually weekly) basis by randomly observing workers behaviors when they are doing their jobs - are some common tools used in the risk management and project safety improvement
- * Safety regulations are usually set and instructions are announced for construction site workers (Example 1)

Project management knowledge areas

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9) Project Procurement Management

Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team.

* What items need to be completed directly by the project members and what are better to be outsourced/ supplied from suppliers is a decision to be made in the project

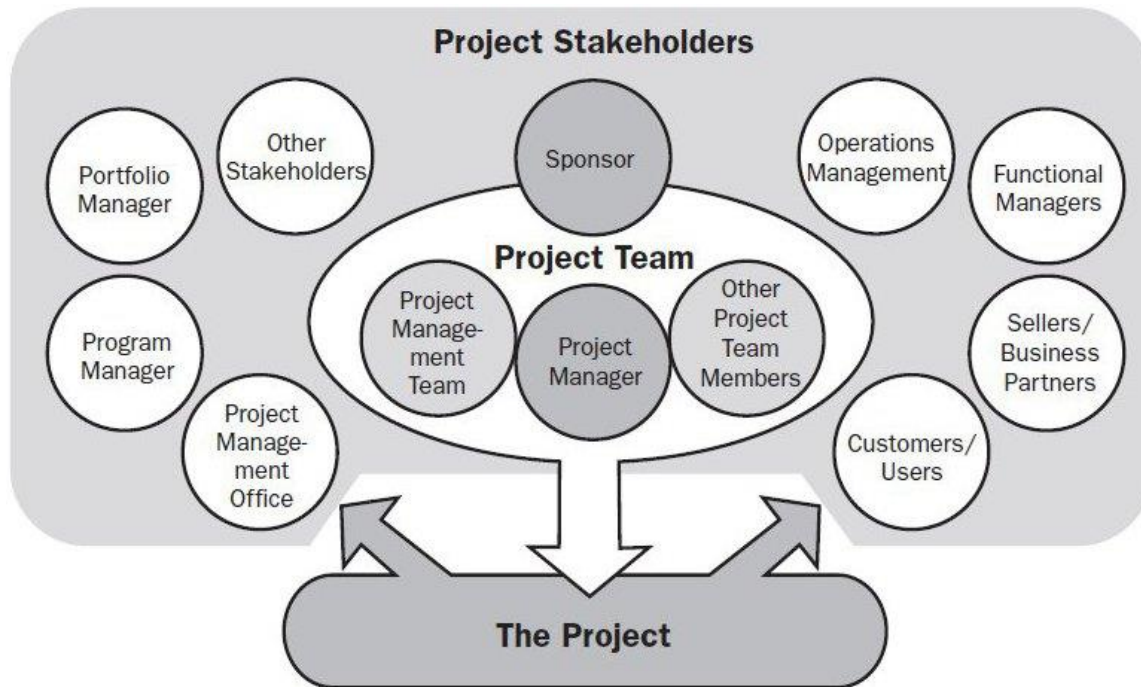
* Procedures for how sub-contractors and suppliers are selected and evaluated are required . Example [1](#), [2](#) and [3](#).

Project management knowledge areas

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10) Project Stakeholder Management

Stakeholders are persons or organizations, who are actively involved in the project or whose interests may be positively or negatively affected by the performance or completion of the project.



The Relationship Between Stakeholders and the Project

Project management knowledge areas

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10) Project Stakeholder Management

Project Stakeholder Management includes the processes required to identify the stakeholders, to analyze their expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution.

In class exercise 2

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Name as many project stakeholders for the following projects as you can! Which ones are more important compared to the others? Discuss it with your classmates:

- 1- Building a residential building in a residential area by the land owner
- 2- Building an overpass between Habibollahi street and Yadegar-Imam highway
- 3- Building a 10-storey building for new department of Architectural Engineering in Sharif University of technology
- 4- Construction of Tehran-Shomal freeway

PM processes and areas mapping

- These knowledge areas are involved in different parts of PM processes. In order to complete a project successfully these 9 PM knowledge areas need to be properly incorporated within 5 PM processes.
- There are 47 sub-processes in PM knowledge areas that can be mapped within PM process groups as are shown in the table (do not expect you to be able to read it-this is just a view)
- The parts that are going to cover in the course are the items within the dashed rectangle

Table 3-1. Project Management Process Group and Knowledge Area Mapping

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Perform Quality Assurance	8.3 Control Quality	
9. Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4 Manage Project Team		
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Control Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses		11.6 Control Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	

PM processes and areas mapping

Project Management Process Groups and Knowledge Areas Mapping

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PM processes and areas mapping

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PM processes and areas mapping

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Considering 47 sub-processes to be followed for addressing all requirements in PM knowledge areas, it can be said that it is almost impossible and so expensive for many projects (especially small projects) to follow PMI guideline. What do you think? Bring your justifications!

PMO, to address the existing complication

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- Project Management Office (PMO) is an organizational unit working in project-based organization to improve project management practices in the organizations by (PMI 2013, P.11):
 - ▣ Managing shared resources across all projects administered by the PMO
 - ▣ Identifying and developing project management methodology, best practices, and standards;
 - ▣ Coaching, mentoring, training, and oversight;
 - ▣ Monitoring compliance with project management standards, policies, procedures, and templates by means of project audits;
 - ▣ Developing and managing project policies, procedures, templates, and other shared documentation
 - ▣ Coordinating communication across projects

PMO, to address the existing complication

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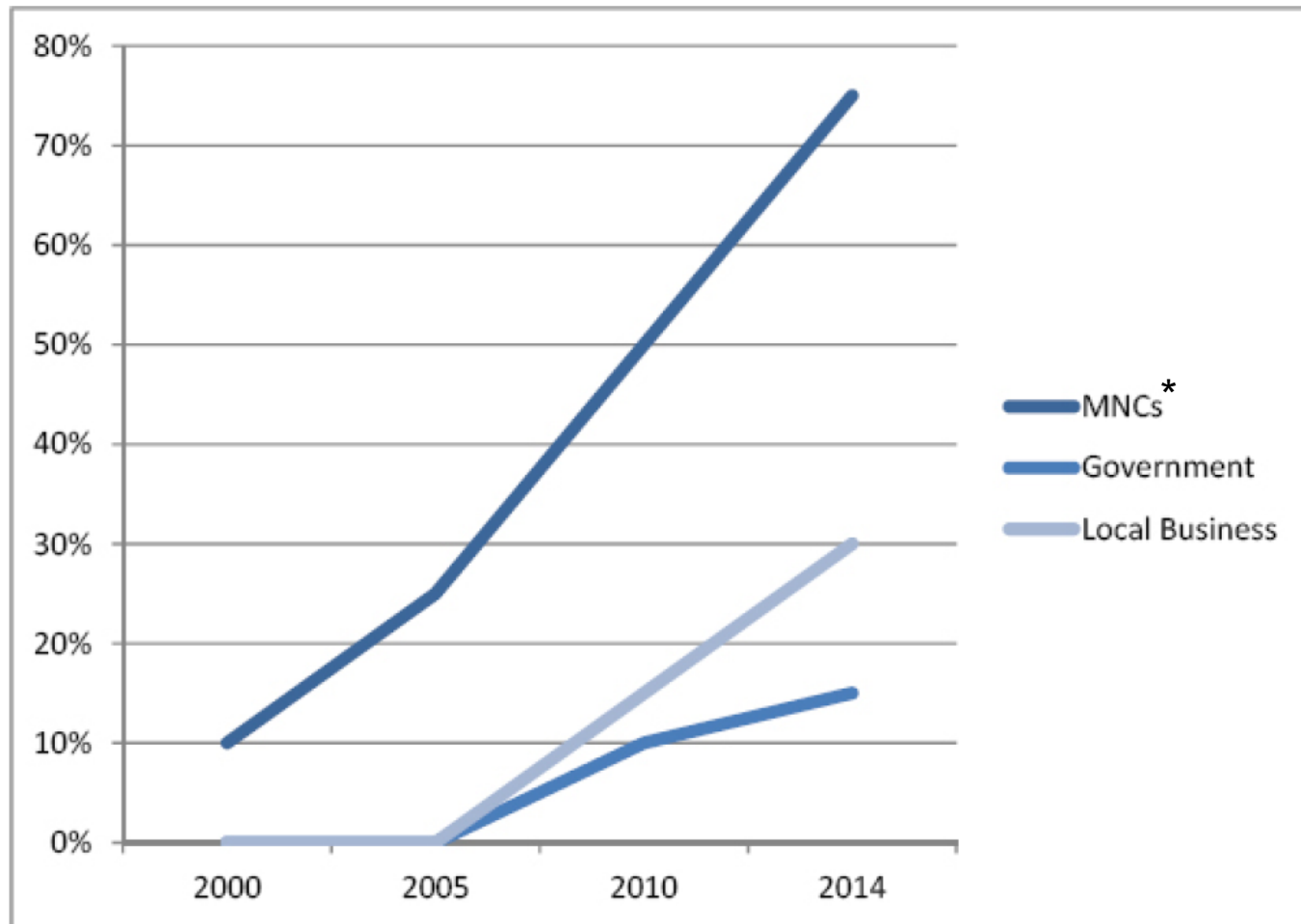


Exhibit 1 – Noted growth in awareness of the significance of the PMO in the Middle East. (Aziz 2014)

* Multinational Corporates

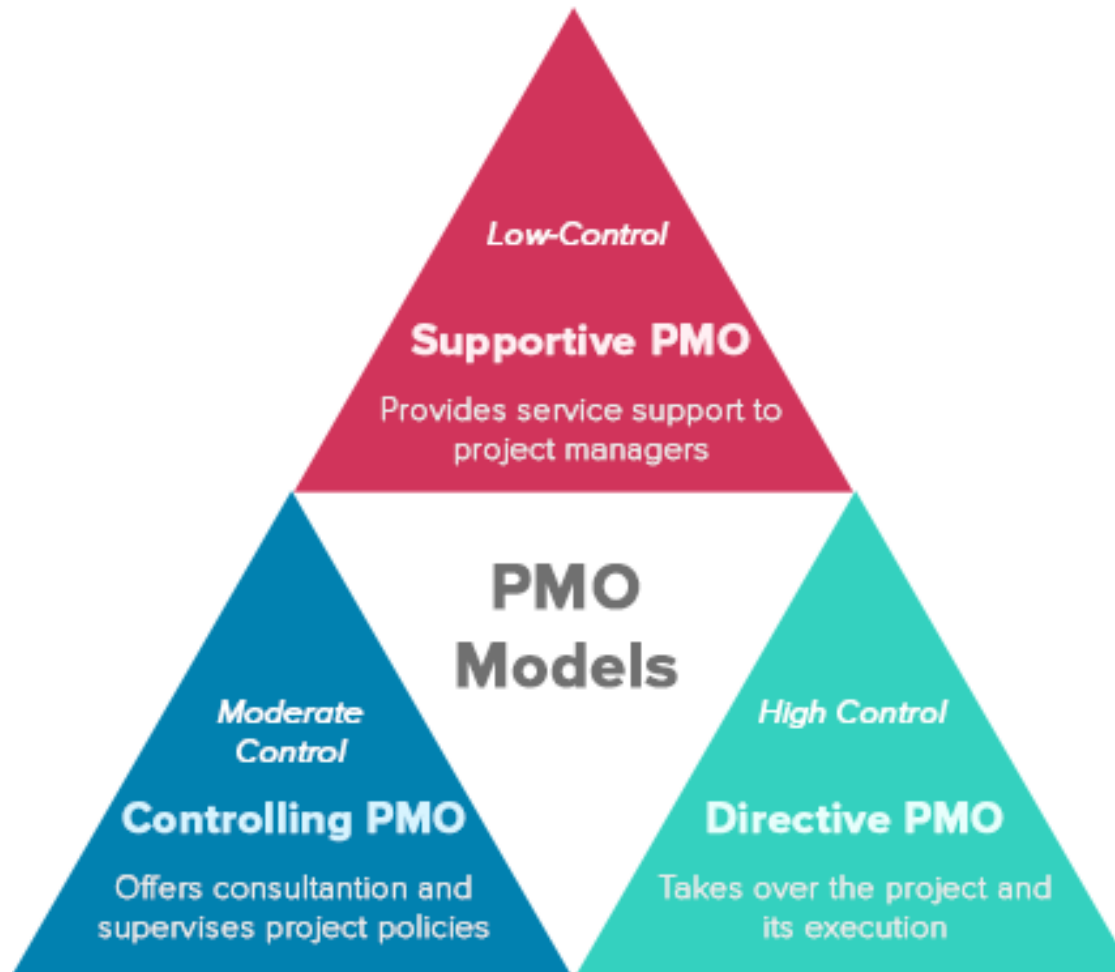
PMO, to address the existing complication

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- Tier-One PMO: The supportive PMO: Provides assistance, support, tools, templates, and guidelines of project management to project management teams, provides status reporting and configuration management. It does not manage or control the project and has a purely consultative role.
- Tier-Two PMO: The controlling PMO: Performs the functions of a Tier-One PMO, as well as a supervisory role on the project management teams. It monitors and controls project management compliance with the developed standards and models. It may allocate project managers to projects.
- Tier-Three PMO: The directive PMO: Performs the functions of tiers one and two, as well as directs and manages the projects. It functions at the project portfolio level.

PMO, to address the existing complication

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In most cases, a Supportive or Controlling PMO would suffice.

Home assignment – Project lifecycle

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Consider an MSc. thesis as a project. Before start doing the project you need to analyze the project lifecycle, PM processes required and different knowledge areas (in all cases consider the University's rules and docs):

- Identify the project lifecycle and describe the main deliverables delivered in each phase (mark: 30%)
- Name samples of works you need to follow during the different PM processes in each phase! (mark: 20%)
- Who are the main stakeholders of the project and how do they affect the project (mark: 20%)
- Develop your ITP for the project (mark: 30%)
- **Due one week-before class**

Reference

- PMI (2013) “A Guide to the Project Management Body of Knowledge” Project Management Institute, Inc: Pennsylvania 19073-3299 USA.
- Aziz, E. E. (2014). The PMO: your key to strategy execution and results delivery. Paper presented at PMI® Global Congress 2014—EMEA, Dubai, United Arab Emirates. Newtown Square, PA: Project Management Institute.



Thank you!