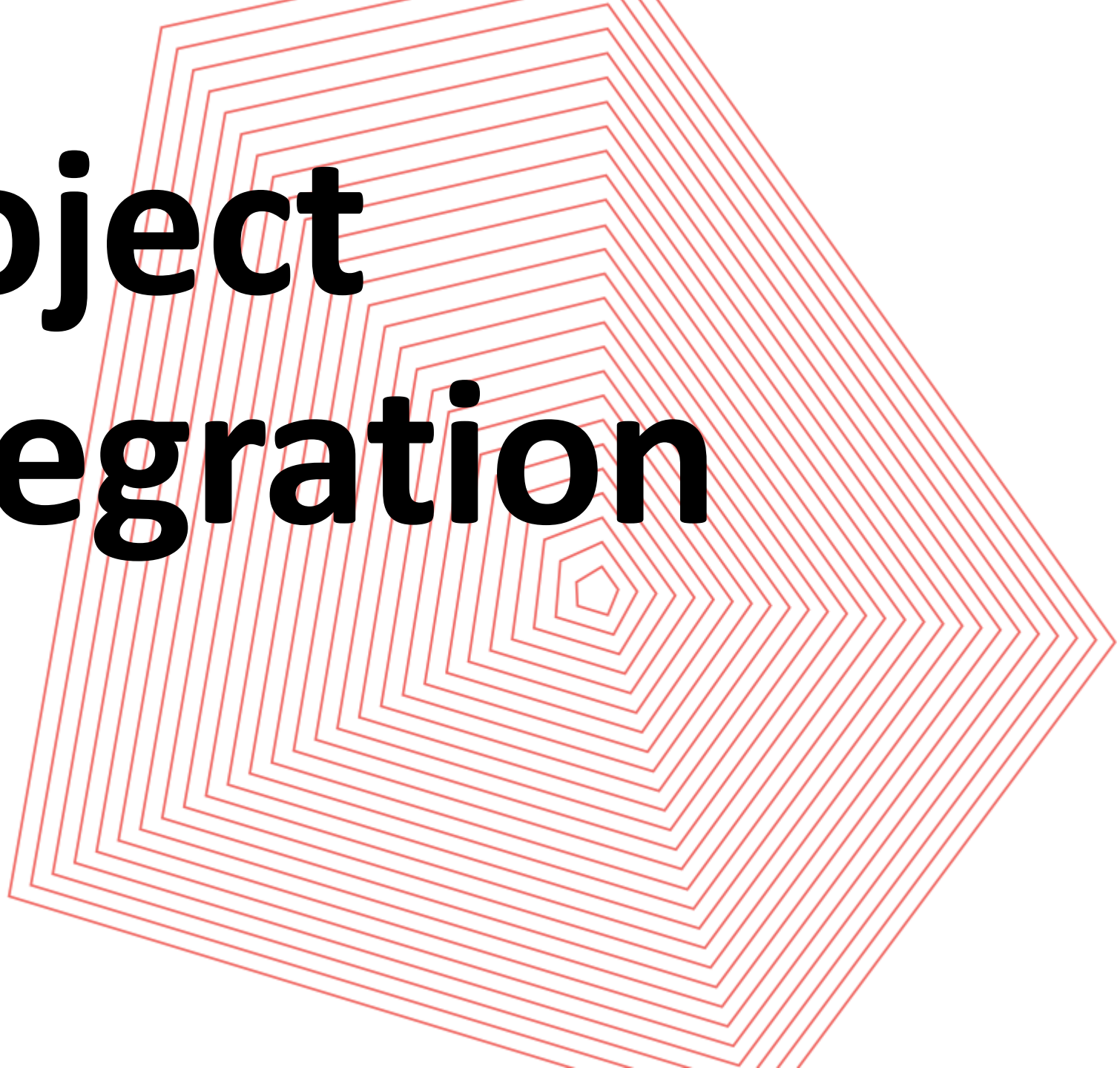
Week 6

GSOE9820 Engineering Project Management
Term 1 2025
Dr. Imrana Kabir

UNSW SYDNEY

Project Integration



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Course Learning Outcomes

- Translate from organisational strategy into project deliverables
- Formulate project scope
- Select and apply project management methods
- **Integrate and justify project plans**
- Evaluate progress and interpret success in projects

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Definition

- Project Integration Management includes the **processes and activities**: to **identify**, **define**, **combine**, **unify**, and **coordinate** the various processes and project management activities within the **Project Management Process** Groups.

- In the project management context, integration includes **characteristics** of: **unification, consolidation**, **communication**, and **interrelationship**. These actions should be applied from the start of the project through completion.

- Project Integration Management includes making **choices** about: **Resource allocation**, **Balancing competing demands**, **Examining any alternative approaches**, **Tailoring the processes to meet the project objectives**, and **Managing the interdependencies** among the Project Management Knowledge Areas.

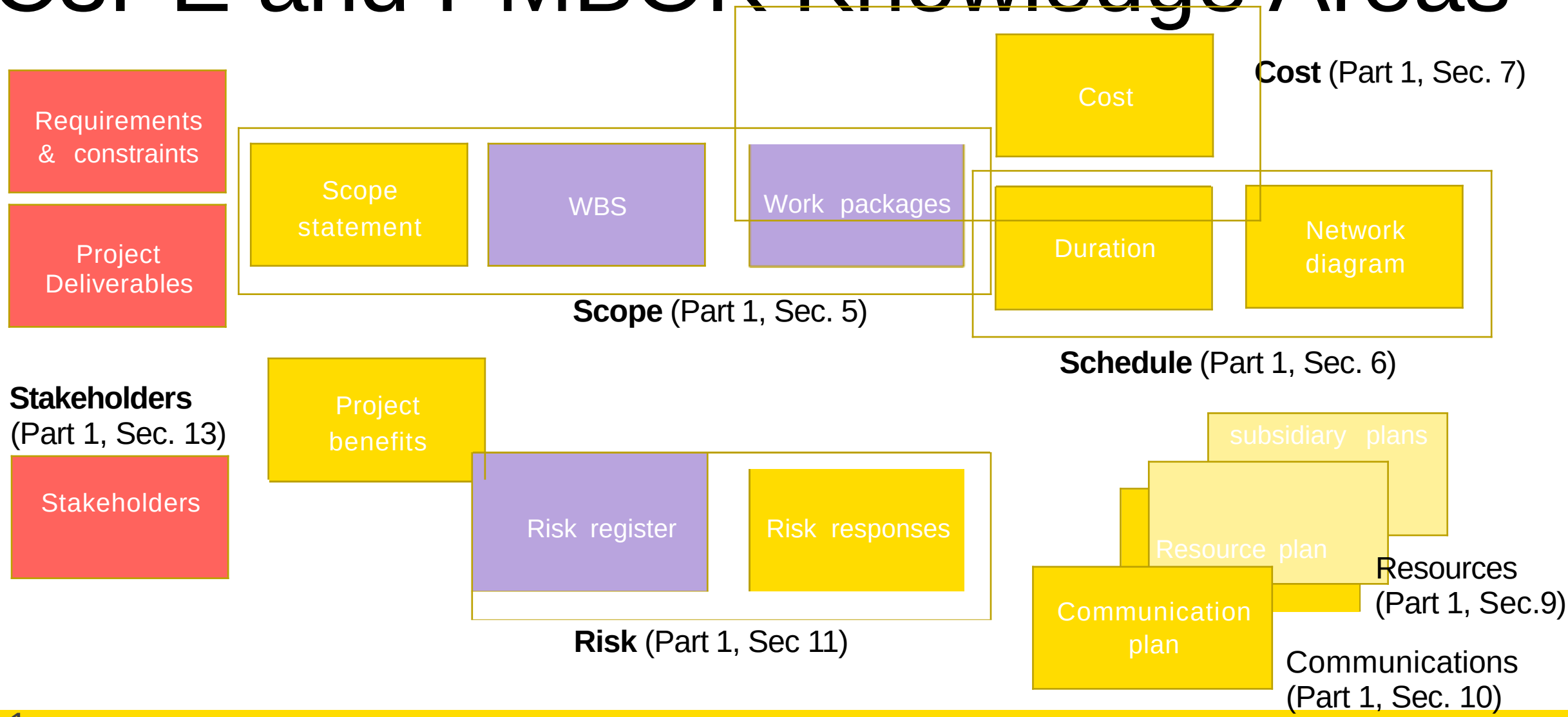
Process groups and Knowledge areas

Table 1-1. 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 Manage Project Knowledge	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	4.7 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 Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 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 Manage Quality	8.3 Control Quality	
9. Project Resource Management		9.1 Plan Resource Management 9.2 Estimate Activity Resources	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	9.6 Control Resources	
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Monitor 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 Implement Risk Responses	11.7 Monitor Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Engagement	13.3 Manage Stakeholder Engagement	13.4 Monitor Stakeholder Engagement	

PMBOK Guide (6th Ed) Part 1, Sec. 1.9

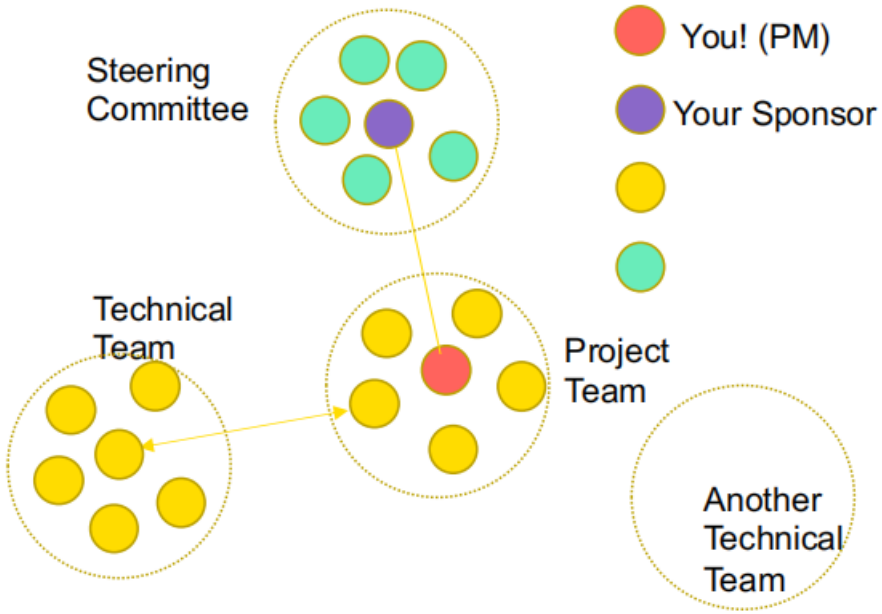
C3PE and PMBOK Knowledge Areas



PMBOK Guide (6th Ed) Part 2, Sec. 1.9 Table 1-1

Key concepts

- Project Integration Management is the **specific responsibility of the project manager** and it **cannot be delegated or transferred**.
- The **project manager** is the one that **combines** the results from all the other **Knowledge Areas** to provide an overall view of the project.
- The project manager is ultimately **responsible** for the project as a whole.
- Projects and project management are **integrative** by nature, with most tasks involving more than one Knowledge Area.
- The **relationships** of processes within the Project Management Process Groups and between the Project Management Process



Integration is:

- Ensuring that the **due dates** of project **deliverables**, the **project life cycle**, and the **benefits** realization plan are aligned;
- Providing a **project management plan** to achieve the **project objectives**;
- Ensuring the **creation** and the use of appropriate **knowledge** to and from the project;
- **Managing** project **performance** and **changes** to the project **activities;**
- Making **integrated decisions** regarding **key changes** impacting the project;
- **Measuring** and **monitoring** progress and taking appropriate **action;**
- **Collecting**, **analyzing** and **communicating** project information to relevant stakeholders;
- **Completing** all the work of the project and formally **closing each phase**, **contract**, and the project as a whole; and
- Managing **phase transitions** when necessary.

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Tailoring

Considerations for tailoring project integration management include but are not limited to:

- Project life cycle. What is an appropriate project life cycle? What phases should comprise the project life cycle?
- Development life cycle. What development life cycle and approach is appropriate for the product, service or result? Is a predictive or adaptive approach appropriate? If adaptive, should the product be developed incrementally or iteratively? Is a hybrid approach best?
- Management approaches. What management processes are most effective based on the organizational culture and the complexity of the project?
- Knowledge management. How will knowledge be managed in the project to foster a collaborative working environment? Change. How will change be managed in the project?
- Governance. What control boards, committees, and other stakeholders are part of the project? What are the project status reporting requirements?
- Lessons learned. What information should be collected throughout and at the end of the project? How will historical information and lessons learned be made available to future projects?
- Benefits. When and how should benefits be reported: at the end of the project or at the end of each iteration or phase?

Lifecycle summary (W1 Lecture)

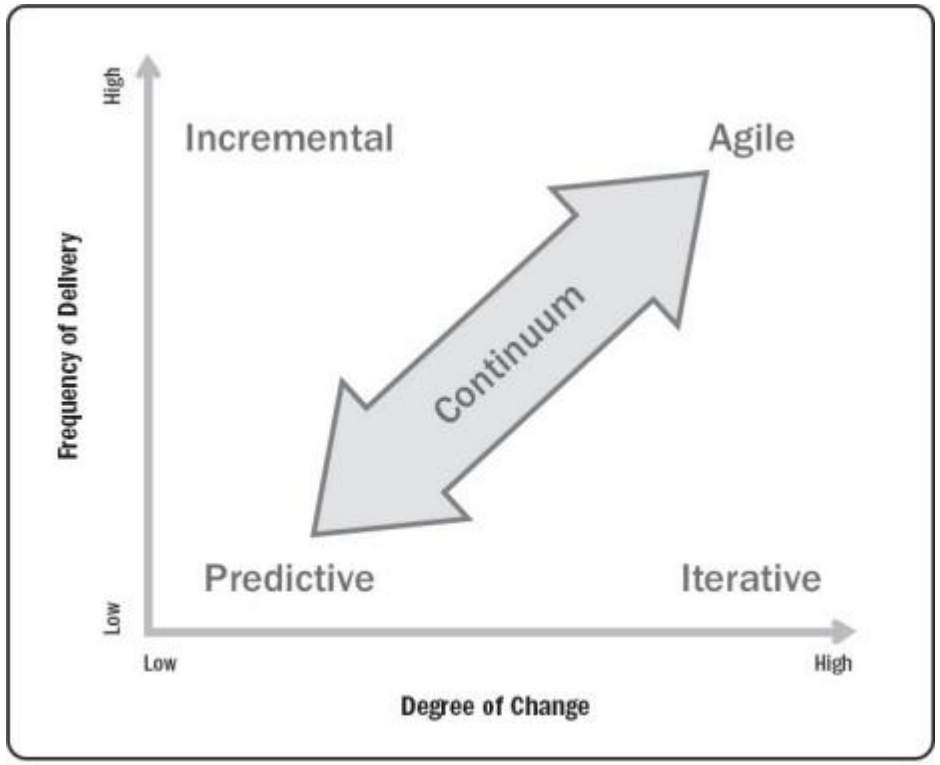


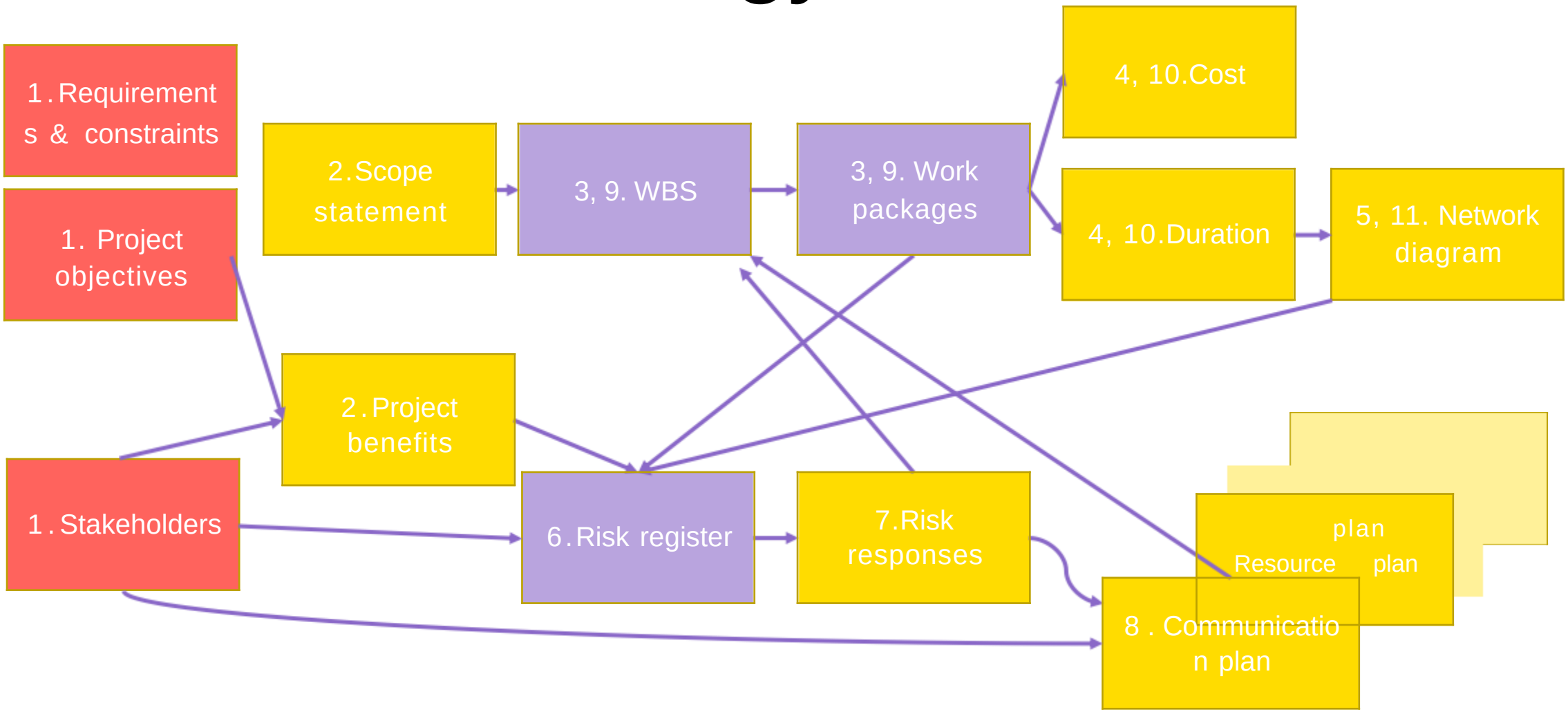
Figure 3-1. The Continuum of Life Cycles

Table 3-1. Characteristics of Four Categories of Life Cycles

Characteristics				
Approach	**Requirements**	**Activities**	**Delivery**	**Goal**
Predictive	Fixed	Performed once for the entire project	Single delivery	Manage cost
Iterative	Dynamic	Repeated until correct	Single delivery	Correctness of solution
Incremental	Dynamic	Performed once for a given increment	Frequent smaller deliveries	Speed
Agile	Dynamic	Repeated until correct	Frequent small deliveries	Customer value via frequent deliveries and feedback

Agile Practice Guide (2017) Sec. 3.1.

C3PE Methodology



PMBOK Guide (6th Ed) Part 2, Sec. 1.9 Table 1-1

Integration in…

Strategy

1. The project benefits a restated in terms of an association between stakeholders and deliverables .

2. The project charter demonstrates how the project benefits – if realised – will further the strategic goals of the project executing organisation

Integration in…

Risk and risk responses
3. Risk identification: the root causes of the project risks are related to other parts of the project plan: WPs, activities, stakeholders or assumptions, or the characteristics of the schedule.
4. The planned risk responses (avoidance, mitigation, contingency, exploitation…) are clearly part of the project scope, meaning they have defined activities, work packages, which in turn are costed and scheduled.
5. The scheduling of activities relating to the risk responses is integrated into the overall project schedule.

Integration in…

Scope and Budget
6. The scope statement and the WBS are consistent.
7. The scope includes all the tangible project deliverables, the outstanding management work required to deliver the whole project, and any additional work such as quality control, testing, communications, and external engagement to ensure an overall successful outcome.
8. All the work packages have been costed and included in the overall budget.
9. The contingency funding (project reserve budget) is distinct from the project budget, and it is costed based on the WP and activities that deliver the contingency risk responses.
10. The budget does not include management reserve.

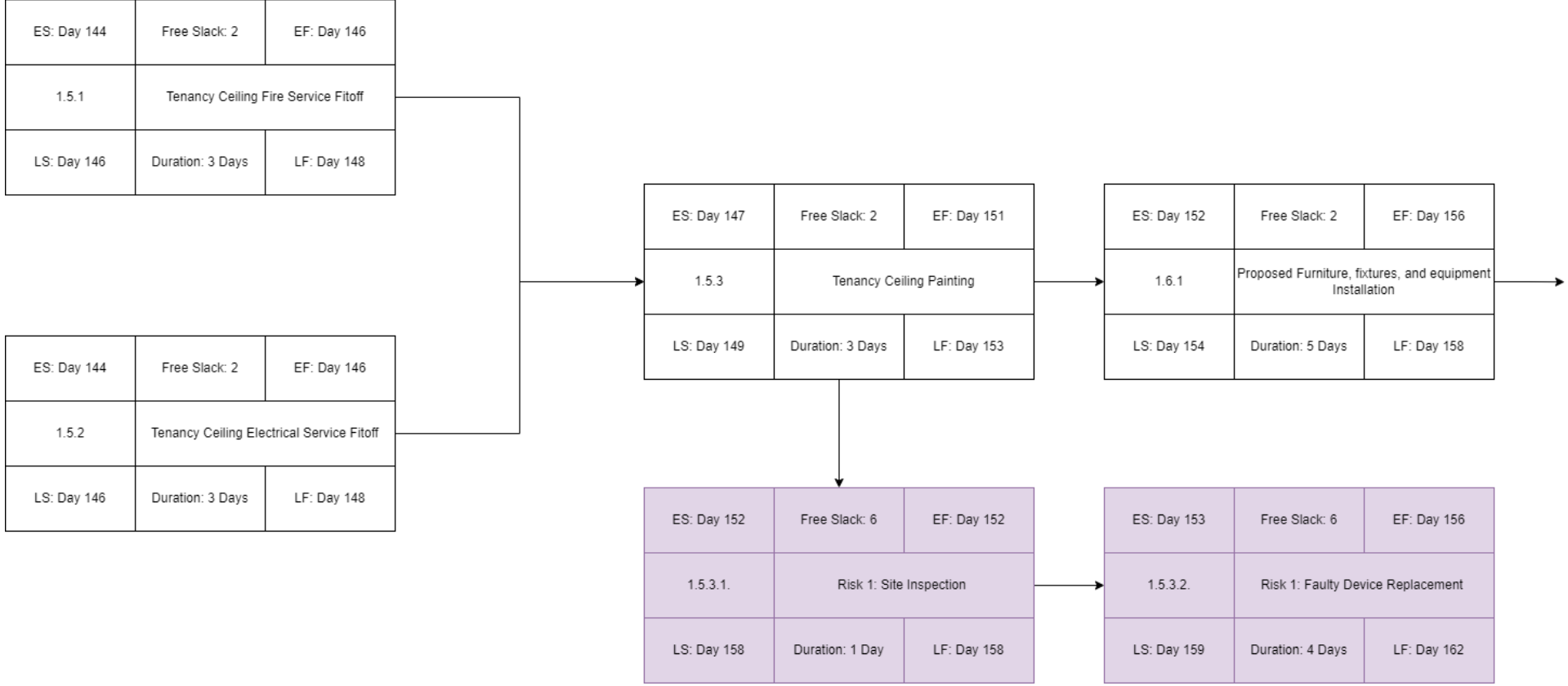
Integration - Example

Risk Register

Category	Risk ID	Description	Likelihood	Severity	Assessment Result	Response	Likelihood	Severity	Assessment Result	Contingency
Coordination , Hardware	1	Service devices (recessed light, smoke detectors etc…) not covered when painting the ceiling, causing devices unfunctional, which requires replacement and will delay the schedule.	2	5	10	Mitigate: 1.Put 'DO NOT PAINT' warning tag on installed devices. 2.Sub-contractors to check cover for all installed devices before ceiling painting.	1	5	5	Allow for $2,000 budget and 1 day for onsite manager to coordinate with subcontractors (electrician, plumber etc…) for site inspection to check if devices being painted still functional. Allow for up to $4,000 budget and 4 days for subcontractors to replace damaged devices

Integration - Example

ID	Activity	Duration (hrs)	Hourly Rate ($)	Labor Cost	Material	Material Cost	Risk ID	Contingency Budget	Contingency Time
1.5.1.	Tenancy Ceiling Fire Service Fitoff	24	$75[1]	$1,800	Scissor Lift, Fire Service Devices (Detector, Alarm etc...)	$600[2] $3,300[3]	N/A		
1.5.2.	Tenancy Ceiling Electrical Service Fitoff	24	$75[1]	$1,800	Scissor Lift	$600[2] $2,800[4]	N/A		
1.5.3.	Tenancy Ceiling Painting	40	$75[1]	$3,000	Scissor Lift	$1,000[2]	1	$6,000 ($2,000 for inspection $4,000 for replacement)	5 days (1 day for inspection, 4 days for replacement)



Activity	Week 28					Week 29					Week 30					Week 30				
1.5.1. Tenancy Ceiling Fire Service Fitoff																				
1.5.2. Tenancy Ceiling Electrical Service Fitoff																				
1.5.3. Tenancy Ceiling Painting																				