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SMARt COmmunities Skills Development in Europe

Project Management

Unit 3

Project Control, Risk Management and Agile Approaches (Scrum)

Cefriel

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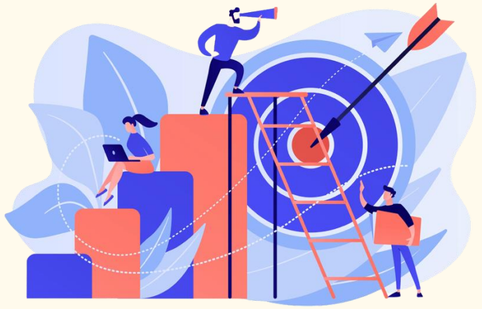
Project Management Module Aims

- Provide a comprehensive overview of project planning, with a focus on scope, requirements, scheduling, and resource management
- Enable participants to understand and apply techniques for defining, decomposing, and estimating project work
- Emphasize the importance of clear requirements and effective communication in project planning
- Equip participants with tools and techniques for monitoring, controlling, and managing project performance
- Introduce risk management principles and processes
- Present Agile project management fundamentals, focusing on the Scrum framework



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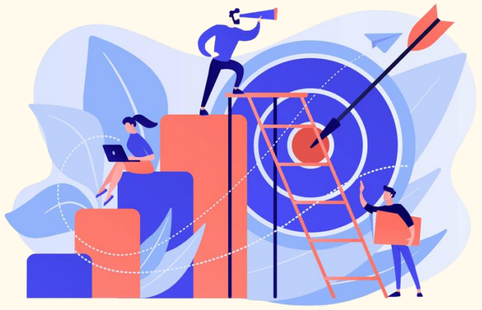
Unit 3 Contents

- **Monitoring and controlling**: baseline establishment, performance measurement, corrective actions
- **Earned Value Management**: planned value, earned value, actual cost, schedule/cost variance, performance indices, forecasting
- **Risk management**: risk definition, objectives, process (plan, identify, analyze, respond, monitor), risk register, qualitative analysis
- **Risk response strategies**: avoid, transfer, mitigate, exploit, share, enhance, accept, escalate, contingent response
- **Agile project management**: Scrum framework, product backlog, user stories, epics, features, sprint backlog, INVEST principles, Scrum ceremonies (planning, daily, refinement, review, retrospective)



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Monitor & Control Project Work

Monitoring and controlling means regularly analyzing project proceedings to identify gaps between planned and actual performance, then planning corrective actions to keep the project on track.

01 Establish Baseline

Plan project performance metrics and create reference points

02 Measure Status

Track current project progress across all dimensions

03 Compare & Forecast

Analyze variance and predict future performance

04 Take Action

Define and implement corrective or preventive measures

This monitoring and controlling approach should be extended to all dimensions of the project—scope, schedule, cost, quality, resources, and risk—to ensure comprehensive project oversight.

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Understanding Project Baselines

A baseline is the approved value or condition against which all future project measurements will be compared. It serves as a formal point of reference and marks the transition from planning to execution and control.

Performance Measurement Baseline

Three critical baselines combine to form the Performance Measurement Baseline (PMB):

Scope Baseline

Approved project scope statement and WBS

Schedule Baseline

Approved project timeline and milestones

Cost Baseline

Approved project budget over time

Establishing the baseline is the formal end of project planning and the beginning of project execution and control activities.

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Earned Value Management

Earned Value Management (EVM) is one of the most effective performance measurement and feedback tools for managing projects. It evaluates project performance in terms of Cost, Time, and Scope.

Core Capabilities

EVM enables comprehensive understanding of project status and accurate forecasting of future performance. It operates on the principle that "The past is a good predictor for the future."

Schedule Questions

- Are we ahead of or behind schedule?
- How efficiently are we using our time?
- When is the project likely to be completed?

Cost Questions

- Are we under or over our budget?
- How efficiently are we using our resources?
- What is the remaining work likely to cost?
- What is the entire project likely to cost?
- How much will we be under or over budget?

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EVM Key Elements

Three fundamental metrics form the foundation of Earned Value Management.
Understanding these elements is critical for accurate project performance measurement.

Planned Value (PV)

The authorized budget assigned to scheduled work. It represents the cost you would have to cover at the status date according to predictions made during the planning stage.

Earned Value (EV)

A measure of work performed expressed in terms of the budget authorized for that work. It refers to the value of what has been completed (in terms of scope) at the status date based on predetermined measurements.

Actual Cost (AC)

Realized cost incurred for the work performed on an activity during a specific time period. It represents the cost really incurred at the status date based on consumed resources that have been measured.

Source: Project Management Institute, A Guide to the Project Management Body of Knowledge (PMBOK® Guide) – Seventh Edition, 2021, Page 101

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EVM Analysis Metrics

Current Status Analysis

Variance metrics reveal current project performance:

Schedule Variance (SV)

EV - PV

Measures schedule performance

Cost Variance (CV)

EV - AC

Measures cost performance

Index metrics provide efficiency ratios:

Schedule Performance Index (SPI)

EV / PV

Schedule efficiency indicator

Cost Performance Index (CPI)

EV / AC

Cost efficiency indicator

Future Performance Forecast

Estimate to Complete (ETC)

Predicted cost to finish remaining work

Estimate at Completion (EAC)

Predicted total project cost

Variance at Completion (VAC)

Expected variance from budget

To-Complete Performance Index (TCPI)

Required efficiency to meet goals

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Risk & Risk Management

Project risk is an uncertain event or condition that, if it occurs, could have effects or impacts on project objectives. Effects are generally negative, but sometimes they can be positive (referred to as opportunities).

Risk Management Objectives

- Reducing the probability and impact of negative events
- Increasing the probability and impact of positive events

> All stakeholders are involved in risk management. Risk management is a continuous process because risks may change, appear, and evolve during the project life cycle.

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Risk Management : Key Factors

Understanding and evaluating risks requires consideration of multiple dimensions that influence both the likelihood and consequences of risk events.

Probability

Likelihood that the event occurs or does not occur

Impact

Resulting consequences from the occurrence of the event

Trigger Condition

Warning signs or conditions that signal risk occurrence

Timing

Possible timing within project phases and lifecycle

Frequency

Possible occurrence frequency of risk events

Threshold

Tolerance levels and acceptability criteria for risks

Risk Factor = Probability × Impact

This formula quantifies risk exposure by combining the likelihood of occurrence with the potential magnitude of consequences, enabling prioritization and resource allocation.

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Risk Management Process

Risk management is an iterative, structured process that spans the entire project lifecycle. Each phase builds upon the previous one to create a comprehensive risk management framework.

Plan Risk Management

Define methods, tools, techniques, thresholds, and all information needed for risk management

Monitor & Control Risks

Keep risks under control, verify effectiveness of actions taken, and identify new risks throughout the project

Identify Risks

Iterative process that identifies potential risks and documents them through a structured list, the Risk Register

Perform Risk Analysis

Classification in terms of priorities and importance (qualitative analysis) and evaluation of outcomes (quantitative analysis)

Plan Risk Responses

Identify and plan actions aimed at reducing risks and their effects (negative risks) or transforming risks into opportunities (positive risks)

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Risk Register

The Risk Register is the comprehensive document containing outputs of all risk management processes. It serves as the central repository for tracking and managing risks throughout the project lifecycle.

Initial Risk Register Contents

- **Complete risk inventory**

  List of all identified risks regardless of their importance and priority

- **Root causes**

  Main causes that can lead to the occurrence of the event associated with the risk

- **Potential interventions**

  List of potential interventions and corrective actions to be revised during Plan Risk Responses

- **Category updates**

  Any updates to risk categories defined in the Risk Management Plan (e.g., Risk Breakdown Structure)

ID	Date	Area	Risk	Description	Probability	Impact	Exposure	Previous	Response	Strategy
1	30-Jul	—	—	—	—	—	0.00	0.00	—	—

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Qualitative Risk Analysis

Qualitative risk analysis prioritizes risks by assessing their probability of occurrence and potential impact on project objectives.
The Probability-Impact Matrix is the primary tool for this assessment.

Risk Assessment Process

Each identified risk requires evaluation on two dimensions:

Probability
High, Medium, or Low likelihood of occurrence

Impact
High, Medium, or Low consequences if it occurs

- Risk Factor (also known as Risk Exposure) = Probability × Impact

The matrix allows you to place risks in terms of priorities through the intersection between probability and impact evaluations, enabling efficient resource allocation for risk response planning.

Probability-Impact Matrix

Probability and Impact Matrix

Probability	Catastrophic - 4	Critical - 3	Marginal - 2	Negligible - 1
Frequent - 4	High (16)	High (12)	Serious (8)	Medium (4)
Probable - 3	High (12)	Serious (9)	Serious (6)	Medium (3)
Remote - 2	Serious (8)	Serious (6)	Medium (4)	Low (2)
Improbable - 1	Medium (4)	Medium (3)	Low (2)	Low (1)

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Risk Response Strategies

Effective risk management requires tailored strategies for different types of risks. Organizations must prepare systematic approaches to handle both threats and opportunities that arise during project execution.

Strategies for Negative Risks (Threats)

Avoid

Change the project management plan to eliminate the threat entirely, isolate project objectives from potential impact, or relax constraints to remove risk exposure.

Transfer

Shift the negative impact of a threat to a third party through insurance, warranties, contracts, or outsourcing arrangements.

Mitigate

Reduce the probability of occurrence or minimize the impact through proactive actions, contingency planning, or additional resources.

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Strategies for Positive Risks (Opportunities)

Exploit

Eliminate uncertainty by ensuring the opportunity definitely occurs. Assign the organization's most talented resources to maximize benefits.

Share

Allocate ownership to a third party best positioned to capture the opportunity through partnerships, joint ventures, or strategic alliances.

Enhance

Increase the probability and positive impacts by facilitating or strengthening the causes of the opportunity.

Universal Strategies for Both Threats and Opportunities

Acceptance

Acknowledge the risk exists without proactive action. The most common active acceptance establishes a contingency reserve of time, money, or resources to handle impacts if they occur.

Escalate

Transfer ownership to a higher organizational level when the risk falls outside the project team's authority or requires senior management decisions.

Contingent Response Strategy: For certain risks, develop response plans executed only under predefined conditions. Set aside appropriate reserves (time or budget) to implement these conditional responses when triggers occur.

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Introduction to Scrum Framework

Purpose and Approach

Scrum is a lightweight framework designed for developing and sustaining complex products in dynamic environments. It addresses complex adaptive problems while delivering products of the highest possible value.

The framework embraces an empirical process that maximizes ROI by recognizing that knowledge comes from experience and making decisions based on what is actually known, not assumptions.

Core Philosophy

Scrum operates as an iterative, incremental process suitable for any product development or work management context.

The framework accepts that the best designs and clearest requirements can rarely be fully defined ahead of time and need to emerge through discovery and adaptation.

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Product Backlog: The Single Source of Requirements

The product backlog serves as the definitive, prioritized list of features and capabilities built from a business perspective. It acts as the single source for all requirements and remains a living document—never complete, always evolving based on emerging needs and insights.

User Stories

Short, simple descriptions of features from an end-user perspective that capture who wants what and why.

Epics

Large bodies of work that can be broken down into multiple user stories, representing significant initiatives.

Features

Functional capabilities that deliver value to users and stakeholders, organized by business priority.

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Sprint Backlog: INVEST Principles

The sprint backlog represents the specific portion of the product backlog committed for implementation during a single sprint. Each backlog item must adhere to the INVEST criteria to ensure quality and manageability.

Independent
Items should stand alone without tight dependencies on other stories.

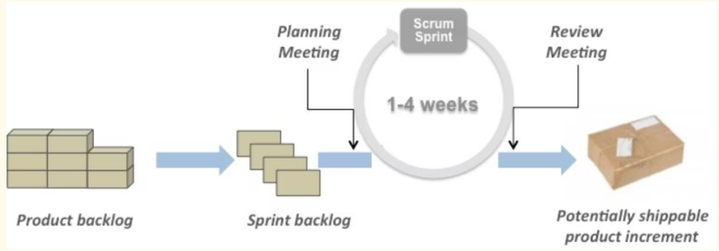
Negotiable
Details can be discussed and refined collaboratively between the team and stakeholders.

Valuable
Each item must deliver clear value to the customer or business.

Estimable
The team must be able to estimate effort and complexity with reasonable accuracy.

Sized Appropriately
Stories should be small enough to complete within a sprint.

Testable
Clear acceptance criteria enable verification that the work is complete.



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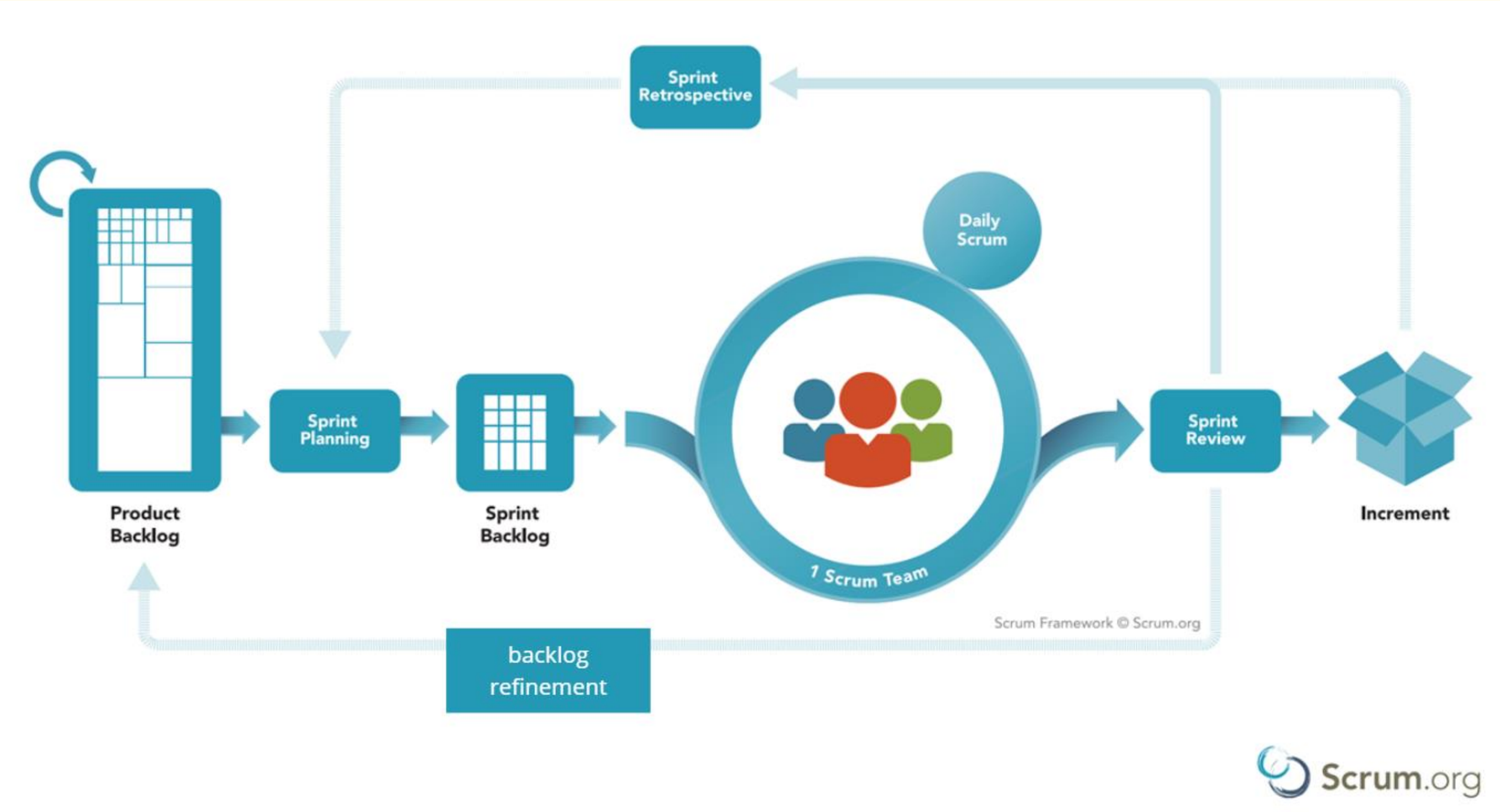
Scrum Ceremonies: The Sprint Cycle



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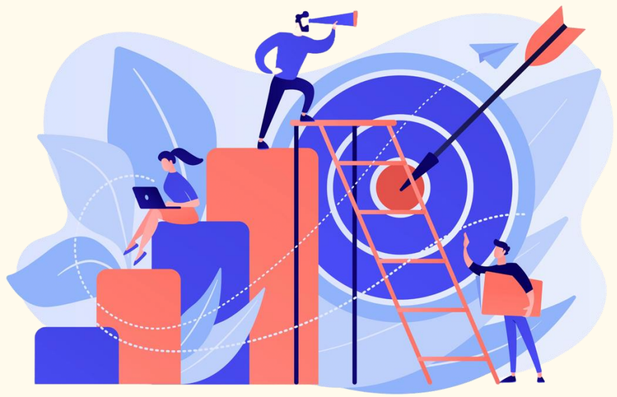
Unit Completed – What's Next?

To consolidate your learning and reflect on the key concepts covered, please take a moment to complete this quiz.

Your feedback and results will help you track your progress and support continuous improvement of the training experience.

Click the link to begin the quiz!



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