Lecture 7 - Project Execution, Monitoring, and Control

Goals of the Unit

- **Purpose**:
  1. Translate project plans into actionable tasks and monitor execution.
  2. Use structured techniques to ensure alignment with schedules, costs, and quality benchmarks.
  3. Apply **Earned Value Analysis (EVA)** for comprehensive project monitoring.

Project Lifecycle Overview

1. **Initiate**: Establish project goals and feasibility.
2. **Plan**: Develop schedules, budgets, and expected outputs.
3. **Execute & Monitor**: Perform planned tasks while tracking progress, risks, and changes.
4. **Close**: Finalize deliverables, document outcomes, and secure approvals.

Project Execution

- **Definition**: Where planned activities are carried out to deliver outputs.
- **Key Activities**:
  1. **Kick-Off Activities**:
     - Establish a formal start for project phases.
     - Align team members with project goals and modalities.
     - Typically conducted through a **kick-off meeting** for clarity and engagement.
  2. **Collect Outputs**: Gather deliverables and verify alignment with the planned scope.
  3. **Monitor Project Health**: Evaluate progress, identify risks, and address resource utilization issues.

Project Monitoring and Control

- **Goals**:
  1. **At the Project Level**: Assess scope, time, cost, and quality; analyze deviations; and implement corrective measures.

2. **At the Organizational Level**: Collect data to improve the accuracy of future project planning.

Monitoring and Controlling Cycle

1. **Collect Data**: Gather real-time information about the project's status.
2. **Measure and Compare**: Benchmark against the baseline plan to highlight deviations and predict outcomes.
3. **Assess and Re-Plan**: Decide whether corrective actions are needed, revise the plan, and repeat the cycle.

Approaches to Monitoring

1. **Non-Integrated Approach**:
   ○ Monitor schedule to check for delays or advancements.
   ○ Track costs to determine over- or under-budget status.
   ○ Provides limited, isolated insights.
2. **Integrated Approach**:
   ○ Use **Earned Value Analysis (EVA)** to integrate schedule, cost, and progress monitoring.
   ○ Delivers a holistic view of project health for better decision-making.

Key Concepts and Processes

- **Baseline (Planned Values)**:
  1. Initial snapshot of the project plan, including schedules and budgets.
  2. Serves as a reference point for monitoring progress.
- **Actual Values**:
  1. Records of actual start and end times, effort, and progress.
- **Process**:
  1. Develop the project plan and save a baseline.
  2. Regularly assess actual progress against planned progress.
  3. Use **effort efficiency** and **progress efficiency** to estimate remaining work.
  4. Share the revised plan, create a new baseline, and repeat the process.

Collecting Effort Data

- **Purpose**: Track time allocation and performance against planned activities.
- **Best Practices**:

- Record weekly for accuracy and consistency.
- Reference planned activities to minimize discrepancies.
- Account for "noise" or variability in reported data.

Cost Control: The Simple Approach

1. **Components**:
   - **Baseline**: Defined by the budget table, outlining expected costs.
   - **Actual Costs**: Captured current expenditures against the baseline.
   - **Reporting Periods**: Costs are monitored periodically (e.g., annually or quarterly).
2. **Example Budget Table**:

CBS Item	Budgeted	Actual	Status	New Budget
Hardware	€10,000.00	€5,000.00	€5,000.00	€5,000.00
Software	€4,000.00	€2,000.00	€2,000.00	€2,000.00
Travel	€5,000.00	€6,000.00	-€1,000.00	€1,000.00
Project Buffer	€3,000.00	€3,000.00	€0.00	€1,000.00
Total	€22,000.00	€13,000.00	€9,000.00	€9,000.00

3.
   Key Points:
   - **Overruns**: Managed by reallocating funds (e.g., from project buffers or other CES items).
   - **Advantages**:
     - Straightforward and practical for tracking discrete items like hardware and software costs.
   - **Disadvantages**:
     - Does not provide a comprehensive view of project health (e.g., ability to complete within the remaining budget).

Earned Value Analysis (EVA)

1. **Overview**:
   - Integrates **planned effort**, **actual progress**, and **costs** into a single monetary-based framework.
   - Enables comparability between effort, progress, and budget.
2. **Benefits**:
   - Progress is directly tied to costs.

- ○ Places budget and expenditures in context (e.g., being under budget may not be favorable if technical progress is insufficient).
  3. **Assumptions**:
     - ○ **Manpower = Cost**: Effort and cost are interchangeable metrics.
     - ○ **Progress = Money**: Progress can be quantified as a portion of planned monetary values.
  4. **Key Metrics**:
     - ○ **Planned Value (PV)**: Budgeted cost of work scheduled at a specific time.
     - ○ **Actual Costs (AC)**: Actual expenditures incurred.
     - ○ **Earned Value (EV)**: Actual progress expressed as a portion of planned value achieved.

Planned Cost and Earned Value Computation

1. **Planned Cost**:
   - ○ Derived cumulatively over time for individual tasks.
- ○ Example:

Task	M1	M2	M3	M4	M5	M6
A	€500	€0	€0	€0	€0	€0
B	€0	€2000	€0	€0	€0	€0
C	€100	€100	€100	€100	€100	€100
Total	€600	€2100	€100	€100	€100	€100

- ○

  Cumulative totals illustrate how costs accumulate progressively over time.
2. **Earned Value Rules**:
   - ○ **Rule 1**: EV should be based on tangible outputs (e.g., completed products).
   - ○ **Rule 2**:
     - ■ **50/50 Rule**: Assign 50% of the planned value at the start and 50% upon completion.
     - ■ **20/80 Rule**: Assign 20% at the start and 80% upon completion.

Earned Value Analysis (EVA) Practical Application

Example Analysis

1. **Overview of Activities:**

- ○ **Activity 1: Progressing as scheduled in terms of time.**
- ○ **Activity 2: Started late but progressing faster than expected.**
- ○ **Activity 3: Started earlier; progress aligns with time elapsed.**
- ○ **Activity 4: Not started yet.**

Baseline vs. Actual Performance

1. **Budgeted Cost of Work Scheduled (BCWS):**
   - ○ **Represents planned values over time for tasks.**
   - ○ **Example:**

Week	Paint Wall	Paint Ceiling	Refurnish	Clean	Cumulative BCWS
W1	€800	€0	€0	€0	€800
W2	€800	€0	€0	€0	€1600
W3	€800	€800	€0	€0	€2400
W5	€800	€800	€400	€400	€5600

2.
   Actual Cost of Work Performed (ACWP):
   - ○ **Tracks actual expenditures for activities.**
   - ○

Week	Paint Wall	Paint Ceiling	Refurnish	Clean	Cumulative ACWP
W1	€900	€0	€0	€0	€900
W2	€900	€0	€0	€0	€1800
W5	€900	€2000	€400	€0	€6000

   - ○ **Example:**

Budgeted Cost of Work Performed (BCWP):
   - ○ **Tracks planned progress achieved (Earned Value).**
   - ○ **Example:**

Week	Paint Wall	Paint Ceiling	Refurnish	Clean	Cumulative BCWP
W1	€800	€0	€0	€0	€800
W2	€1600	€0	€0	€0	€1600
W5	€1600	€1600	€400	€0	€5200

Comments and Observations

1. **Progress and Noise:**
   - **Variations in progress are influenced by assumptions like the 50%-50% rule.**
   - **For example:**
     - **Early weeks show inflated progress due to early accrual of 50% value.**
2. **Budget Context:**
   - **While ahead of schedule in W5, cost efficiency declines as tasks progress.**
   - **Final completion of activities will adjust cumulative data and provide clearer insights.**
3. **Practical Application:**
   - **Adjust forecasts as data accuracy improves with activity completion.**
   - **Ensure progress reflects actual performance, not artifacts of simplistic rules.**

Types of Project Closures

1. **Termination by Integration/Addition:**
   - **Outputs are integrated into other projects or used as inputs for production.**
   - **Typically observed in successful projects.**
2. **Termination by Starvation:**
   - **Project halts due to a lack of resources (budget, personnel, or materials).**
3. **Termination by Extinction:**
   - **Management ends the project due to unmet objectives, obsolescence, or financial unviability.**

The Project Closing Phase

1. **Definition:**
   - **The final phase where deliverables are transferred to stakeholders, contractual obligations are resolved, and project records are archived.**
2. **Goals:**
   - **Ensure usability of project outputs.**
   - **Resolve pending obligations.**
   - **Document lessons learned for future reference.**

Challenges in Closing Projects

1. **For Unsuccessful Projects:**
   - **Team disinterest and reluctance.**
2. **General Challenges:**
   - **Low team motivation and interest as the project concludes.**
   - **High cost of closing activities with limited creativity.**
   - **Loss of implicit knowledge due to poor documentation.**
   - **Reluctance to release resources for other opportunities.**
   - **Emotional detachment or burnout after long-term projects.**

Steps in the Project Closing Process

1. **Obtain Client Acceptance:**
   - *Ceremonial*: **Informal acceptance (e.g., handshake agreements).**
   - *Formal*: **Structured approvals via testing and documentation.**
2. **Install Project Deliverables:**
   - **Ensure the outputs are fully functional and integrated.**
3. **Archive Deliverables:**
   - **Properly store documents, artifacts, and relevant files for future reference.**
4. **Document the Project:**
   - **Record key decisions, processes, and results for organizational learning.**
5. **Financial Closure:**
   - **Finalize all budget-related matters.**
6. **Post-Implementation Audit:**
   - **Evaluate project performance and outcomes for lessons learned.**
7. **Release Staff:**
   - **Transition team members to new roles or projects with proper recognition and assignments.**

Post-Implementation Audit (Post-Mortem)

1. **Purpose:**
   - **Analyze the project critically to identify successes, failures, and areas for improvement.**
2. **Structure:**
   - **Conduct surveys to gather insights.**
   - **Collect objective data, such as cost, effort, and schedule metrics.**
   - **Hold debriefing meetings and root cause analysis sessions.**
   - **Publish findings to ensure the team and organization learn from the experience.**

3. **Metrics:**
   - **Cost: Planned vs. actual costs and effort.**
   - **Schedule: Original vs. final timelines.**
   - **Quality: Errors, requirement changes, and code modifications.**
4. **Report Structure:**
   - **Description: Contextual details about the project.**
   - **The Good: What worked well.**
   - **The Bad: Factors hindering the achievement of goals.**
   - **The Ugly: Prescriptive measures for improvement.**

Releasing Project Staff

1. **Key Considerations:**
   - **Acknowledge the experience and achievements gained during the project.**
   - **Assign meaningful and relevant tasks for team members in their next roles.**
2. **Transition Challenges:**
   - **Address the potential disruption caused by transitioning from long-term projects.**