

■ Lec 1 - Agile Software project Management

A Project Manager is the leader responsible for guiding a project from start to finish, ensuring it meets objectives, timelines, and budgets. Their role revolves around four core functions:

Planning – Defines scope, goals, and deliverables. Creates timelines and task breakdowns

Scheduling – Assigns tasks, sets deadlines, tracks progress, and adjusts for risks or changes.

Coordinating – Ensures communication among teams, stakeholders, and clients. Manages task dependencies.

Working with People – Leads, motivates, resolves conflicts, and facilitates collaboration (e.g., daily stand-ups).

Project life cycle

Definition of a Phase: A project phase is marked by the completion and approval of deliverables.

Phases can overlap in iterative development (e.g., Agile).

Flexibility in Phases: A new phase can begin before the previous one ends (common in Agile/iterative projects).

A phase can close without starting the next one



Organizational Structures Overview

1. Functional Organization Structure: Departments (Engineering, Marketing, Finance) with specialized teams.

Pros: Clear authority and specialization, Eliminates resource duplication, Defined career paths.

Cons: Silos hinder cross-functional collaboration, Slow decision-making, Weak project leadership (PMs lack authority). Example: Traditional corporate departments.

2. Projectized Organization Structure: Teams organized by projects (Project A, Project B).

Pros: Strong PM authority (unity of command), Efficient communication within projects.

Cons: Resource duplication (e.g., separate engineers per project), Unclear career growth post-project.

Example: Construction, defense projects.

3. Matrix Organization Structure: Hybrid (functional + project teams).

Types: **Weak Matrix:** Functional managers dominate.

Balanced Matrix: Shared power. **Strong Matrix:** PMs have more control.

Pros: Efficient resource use, Cross-functional collaboration.

Cons: Complexity (two reporting lines), Priority conflicts.

Example: Agile software development.

Agile Manifesto

Individuals & Interactions > Tools & Processes

Focus: Team collaboration and communication matter more than rigid tools. Example: Daily stand-ups over automated reporting.

Working Software > Comprehensive Documentation

Focus: Deliver functional products rather than exhaustive paperwork. Example: A usable app prototype over a 100-page spec document.

Customer Collaboration > Contract Negotiation

Focus: Partner with clients flexibly instead of rigid contracts. Example: Regular client feedback sessions over fixed-scope contracts.

Responding to Change > Following a Plan

Focus: Adaptability trumps sticking to an initial plan. Example: Pivoting features based on user testing vs. rigid Gantt charts.

Agile Methodologies Scrum, Kanban, XP, RUP, Crystal

SCRUM masters

Servant Leader - Supports the team by removing obstacles, not commanding them. Focuses on enabling self-organization and collaboration.

Blocker Resolver - Identifies and eliminates impediments (e.g., resource shortages, communication gaps). Shields the team from external distractions.

Guardian of the Process - Ensures Scrum rules are followed (e.g., time-boxed sprints, daily stand-ups). Facilitates ceremonies (Planning, Review, Retrospective).

Writing User-stories/Epics

As <persona>, I want <what?> so that <why?>

Backlog Grooming

- Removing user stories that no longer appear relevant
- Creating new user stories in response to newly discovered needs
- Re-assessing the relative priority of stories
- Assigning estimates to stories which have yet to receive one
- Correcting estimates in light of newly discovered information

- Splitting user stories which are high priority but too coarse grained to fit in an upcoming iteration

Goal: Maintain a clear, prioritized, and actionable backlog for efficient sprint planning.

Best Practices: Conduct grooming sessions regularly (e.g., weekly), Involve the full team (Dev, QA, PO) for accuracy.

Outcome: Smoother sprint execution and faster delivery of high-value work.

Planning Poker

A collaborative, consensus-based estimation technique where the Scrum team assigns story points to backlog items using a modified Fibonacci sequence (1, 2, 3, 5, 8, 13, 20, 40, 100). **STEPS:**

1. The entire scrum team gathers with planning poker cards or a planning poker mobile application.

2. Scrum master takes each item in the product backlog and discusses it with the team.

3. Each team member individually selects a value from the cards or from the mobile application. It is not revealed to anyone yet.

4. When the scrum master gives the signal, everyone reveals the estimated values.

5. After looking at all the values, the members with the largest values and the smallest values explain the reasons behind their estimations. Everyone listens to the explanations and if needed others can add their comments as well.

6. Next, they go for another round in the same manner.

7. This is performed until the estimates converge to a closer number or majority of the team members votes for the same value.

8. The next backlog item is selected, and the same process is performed.

9. This is done until the team feels that they have estimated sufficient items to fill in for a new

Daily Scrum (Standup) - Focused & Effective

Purpose: 15-minute sync for the Dev Team (not a status meeting for managers), Plan the day and uncover blockers—no detailed discussions (take them offline).

"What did I do yesterday?"

Example: "Finished the login API and reviewed PR #45."

"What will I do today?"

Example: "Start on the payment integration and test edge cases."

"Impediments?" (Blockers only!)

Example: "Need DB credentials from DevOps to proceed."

■ Lec 2 - Project Communications Management

Importance of Good Communications

Communication failure is the biggest threat to projects, IT professionals are not typically seen as good communicators, Effective communication is essential for IT job success, Strong verbal and non-technical skills are key for career growth.

Project Communications Management Processes

1. Planning Communications Management

Identify stakeholder information needs.

Decide how to meet those needs effectively.

2. Managing Communications

Create, distribute, store, retrieve, and dispose of project communication.

Follow the communications management plan.

3. Controlling Communications

Monitor and control project communication.

Ensure stakeholders' communication needs are met.

Importance of Face-to-Face Communication

Based on research in face-to-face interaction:

58% = Body language, 35% = Tone of voice, 7% = Actual words spoken

Interpretation is based mostly on non-verbal cues. Always consider how something is said, not just what is said.

Encouraging More Face-to-Face Interactions

Short, frequent meetings are effective (e.g., daily stand-ups), Stand-up meetings help people stay focused, Some companies limit email usage during specific hours/days to promote talking.

Distributing Information in an Effective and Timely Manner

Don't bury important information, Don't hide or delay bad news—report it honestly, Use oral communication (meetings, informal talks) to openly share information.

Other Communication Considerations - The receiver may interpret the message differently than intended, **Geographic and cultural factors add complexity:** Different time zones, Language differences, Cultural norms and working styles

Determining the Number of Communication Channels

As team size increases, communication complexity increases.

Use the formula: Communication Channels = n(n-1)/2

(where n = number of people)

Example: For 5 people > 5(5-1)/2 = 10 channels

Planning Communications Management

Every project must have a communications management plan, Plan should be based on project size and needs:

Small projects: May include in the team contract.

Large projects: Should have a separate, detailed document.

Contents of a Communications Management Plan

Stakeholder communication requirements, Information to be communicated (format, content, detail), Sender and receiver of information, Suggested communication methods or technologies, Frequency of communication (e.g., daily, weekly), Escalation procedures for resolving issues, Revision procedures for updating the plan, A glossary of terms to avoid confusion.

Managing Communications

A large part of a project manager's job, Get the right info to the right people at the right time.

Must ensure communication is: Timely, Useful, Delivered through the right channel

Considerations: Use of technology, Suitable methods/media, Performance reporting

Reporting Performance

Helps stakeholders stay informed about project progress:

Status Reports – Current state of the project at a specific time. **Progress Reports** – What has been done over a period. **Forecasts** – Predicted future progress/status based on trends and data.

Controlling Communications

Goal: Ensure optimal flow of information throughout the project.

The PM and team should: Use reports and judgment to assess communication, Identify and fix communication problems, Make changes to the planning or managing process if needed, Sometimes an external facilitator helps assess how well communication is working.

■ Lec 3 - Human Resource Management

Importance of Human Resource Management

People are often considered the most important asset in organizations. Project success or failure is determined by people, not tools or processes.

What is Project Human Resource Management?

Focuses on using people effectively in a project. Includes four key processes:

Planning Human Resource Management - Identify and document roles, responsibilities, and reporting relationships.

Acquiring the Project Team - Obtain the right people and assign them to the project.

Developing the Project Team - Improve team members' skills and teamwork to enhance performance.

Managing the Project Team - Monitor performance, motivate, give feedback, resolve conflicts, and coordinate changes.

Keys to Managing People

Important **knowledge areas** for managing people: Motivation Theories, Influence and Power, Effectiveness.

Psychologists and theorists have done extensive research in these areas.

Developing the Human Resource Plan

Includes documenting: Project organizational charts – show team structure, Staffing management plan – details hiring, training, and release of team members, Responsibility Assignment Matrix (RAM) – links tasks with people responsible, Resource histograms – visualize resource usage over time.

Responsibility Assignment Matrix (RAM)

Maps project tasks (WBS) to the people responsible (OBS). Helps clearly define who does what in the project.

RACI Chart (a type of RAM) Each task is assigned:

R – Responsible (performs the task)

A – Accountable (final decision maker; only one per task)

C – Consulted (provides input)

I – Informed (kept in the loop)

Note: Some definitions of R and A may be reversed by different sources.

Acquiring the Project Team

Getting qualified people is critical to project success. If the PM is the smartest person on the team, they didn't recruit well. Match skills and timing of team members to project needs.

Developing the Project Team

Goal: Improve team performance by enhancing collaboration and skills, Teamwork is essential for project success.

Tuckman Model of Team Development

Stages of team growth: **Forming** – Team meets and learns about the project. **Storming** – Conflicts may arise; team members push boundaries. **Norming** – Team settles into roles and begins to work cooperatively. **Performing** – High-functioning and productive team. **Adjourning** – Project ends; team disbands.

Managing the Project Team **Project manager must:** Lead the team in completing work.

Use performance data to decide:

Whether to request project changes.

Whether to take corrective/preventive action.

Whether to update the project plan or organization assets.

Tools and Techniques for Managing Teams

Observation and conversation – Regular interaction helps spot problems early.

Performance appraisals – Formal evaluation of team member work.

Interpersonal skills – Such as leadership, motivation, and communication.

Conflict management – Resolving disputes to maintain team harmony.

Conflict Handling Modes

Six ways to deal with conflict: **Confrontation** (Problem Solving) – Address conflict directly with facts, **Compromise** – Each party gives something up.

Smoothing – Minimize differences, emphasize common ground.

Forcing – Win/lose outcome using authority or pressure.

Withdrawal – Avoid or ignore the conflict.

Collaborating – Combine multiple viewpoints for a win-win solution.

■ Lec 4 - Project Cost Management

Importance of Project Cost Management

Many IT projects often fail to stay within budget.

According to CHAOS studies: In 1994, the average cost overrun was 180%. By 2001, this dropped to 45%.

A 2011 Harvard Business Review study found: Average cost overrun = 27%. **More importantly, many projects had huge unexpected overruns – known as "black swans".**

Why it matters: Cost overruns can cause project failure or company losses, Managing project costs properly is critical for success.

What is Cost and Project Cost Management?

Cost: A cost is any resource (usually money) given up to achieve a specific goal. It is what you sacrifice to gain something else. Typically measured in dollars (or other currency).

Project Cost Management: It refers to the processes used to ensure a project is completed within the approved budget.

Involves planning, estimating, budgeting, and controlling costs throughout the project.

4 Key Processes of Project Cost Management

Planning Cost Management: Define how cost-related activities will be managed, Set policies, procedures, and documentation standards.

Estimating Costs: Develop a realistic approximation of costs for all project resources (labor, materials, etc.).

Determining the Budget: Add up all cost estimates and assign them to work items, This creates a cost baseline for tracking project performance.

Controlling Costs: Monitor actual spending, Manage changes to the budget, Ensure spending stays within the approved limits

Basic Principles of Cost Management

- Profits are revenues minus expenditures
- Profit margin is the ratio of revenues to profits
- Life cycle costing considers the total cost of ownership, or development plus support costs,

- for a project
- Cash flow analysis determines the estimated annual costs and benefits for a project and the resulting annual cash flow

Types of Costs and Benefits

- Tangible costs** or benefits are those costs or benefits that an organization can easily measure in dollars.
- Intangible costs** or benefits are costs or benefits that are difficult to measure in monetary terms.

- Direct costs** are costs that can be directly related to producing the products and services of the project.
- Indirect costs** are costs that are not directly related to the products or services of the project but are indirectly related to performing the project.
- Sunk cost** is money that has been spent in the past; when deciding what projects to invest in or continue, you should not include sunk costs.

More Principles of Cost Management

Learning Curve Theory

Repetitive work = Lower cost per unit as workers gain experience.

Reserves for Uncertainty

Contingency Reserves = For known risks you can somewhat predict (e.g. rework, delays).

Included in cost baseline - Management Reserves = For unknown risks that can't be predicted (e.g. market crash).

Not included in the baseline – requires approval to use

Planning Cost Management

- The project team uses expert judgment, analytical techniques, and meetings to develop the cost management plan.

A cost management plan includes:

- Level of accuracy and units of measure
- Organizational procedure links
- Control thresholds
- Rules of performance measurement

- Reporting formats

- Process descriptions

Student ID :

Module Code :

Estimating Costs: Cost estimates are crucial for staying within budget. Project managers must estimate seriously.

Understand different types of cost estimates. Know how to prepare accurate cost estimates. Be aware of common problems in IT cost estimating.

Cost Estimation Tools and Techniques:

Analogous (Top-down) estimates: Use costs from similar past projects to estimate current project costs.

Bottom-up estimates: Estimate costs for each work item individually, then add them up for the total.

Parametric modeling: Use mathematical models based on project parameters to estimate costs.

Typical Problems with IT Cost Estimates

- Estimates are done too quickly.
- People lack estimating experience.
- Human beings are biased toward underestimation.
- Management desires accuracy.

Determining the Budget

Goal: Allocate estimated costs to specific project activities over time. WBS (Work Breakdown Structure): Needed to identify and organize work items.

Cost Baseline: A time-phased budget used to track and manage cost performance.

Controlling Costs - Involves monitoring and managing changes to the project budget.

Key tasks: Track cost performance, Approve only necessary changes to the cost baseline, Notify stakeholders of cost-related changes.

Challenge: Many organizations struggle with effective cost control.

Earned Value Management (EVM)

- Earned value management (EVM)** is a methodology that combines scope, schedule, and resource measurements to assess project performance and progress.

- Planned value (PV)** is the authorized budget assigned to scheduled work.
- Earned value (EV)** is a measure of work performed expressed in terms of the budget authorized for that work.
- Actual cost (AC)** is the realized cost incurred for the work performed on an activity during a specific time period.

Variance Calculations

Schedule Variance (SV): Measures schedule performance. Shows how much the project is ahead or behind the planned schedule. **Formula: SV = EV - PV**

EV = Earned Value (work actually done, in budget terms)

PV = Planned Value (work planned to be done, in budget terms)

Cost Variance (CV): Measures cost performance. Shows budget shortage or surplus at a given point in time.

Formula: CV = EV - AC

AC = Actual Cost (cost incurred so far)

Budget at Completion (BAC): The total approved budget for the entire project. **Variance at Completion (VAC):** Predicts budget variance at project completion.

Formula: VAC = BAC - EAC

EAC = Estimate at Completion (forecasted total cost)

Performance Calculations - Important Points

Quality Control - Ability to anticipate situations and prepare actions for desired outcomes.

Important to prevent defects by: Selecting proper materials, Training and indoctrinating personnel on quality principles, Planning processes that ensure the desired results

Scope Aspects of IT Projects

Functionality: How well a system performs its intended functions.
Features: Special characteristics of a system that appeal to users.
System Outputs: Includes screens and reports generated by the system.

Performance: How well the product/service meets customer use expectations.

Reliability: Ability to perform as expected under normal conditions.

Maintainability: Ease of performing maintenance on the product.

Controlling Quality

Main outputs of quality control include: Acceptance decisions (whether deliverables meet quality standards)
• Rework (correcting defects)
• Process adjustments (improving processes based on quality results)
• Uses Seven Basic Tools of Quality to aid in control activities.

Cause-and-Effect Diagrams - • Also called Fishbone or Ishikawa diagrams • Trace quality complaints back to root causes in production or processes • Help identify root causes rather than symptoms • Use the 5 Whys technique: repeatedly ask "Why?" (about five times) to drill down to the underlying cause.

Quality Control Charts - A control chart is a graphical tool that displays process data over time. • Its main purpose is to prevent defects by monitoring the process, not just to detect or reject faulty output.

It helps determine if a process is:

In control: Variations in results are due to random causes (natural fluctuations); no adjustments needed.

Out of control: Variations are due to non-random causes (specific problems); these causes must be identified and the process adjusted to fix or eliminate them.

Checksheet • A tool used to systematically collect and analyze data. • Sometimes called a tally sheet or checklist, depending on its format.

• **Example:** Identifies that most complaints come via text messages and more occur on Monday and Tuesday.

• This data helps identify patterns and improve processes, such as how complaints are handled.

Scatter Diagram

• A scatter diagram helps to show if there is a relationship between two variables.

• The closer data points are to a diagonal line, the more closely the two variables are relate

Histograms -A histogram is a bar graph of a distribution of variables. •Each bar represents an attribute or characteristic of a problem or situation, and the height of the bar represents its frequency.

Pareto Charts

•A Pareto chart is a histogram that can help you identify and prioritize problem areas. •Pareto analysis is also called the 80-20 rule, meaning that 80 percent of problems are often due to 20 percent of the causes

Flowcharts

•Flowcharts are graphic displays of the logic and flow of processes that help you analyze how problems occur and how processes can be improved.

•They show activities, decision points, and the order of how information is processed

Run Charts

• In addition to flowcharts, run charts are also used for stratification, a technique that shows data from a variety of sources to see if a pattern emerges.

• A run chart displays the history and pattern of variation of a process over time.

• You can use run charts to perform trend analysis and forecast future outcomes based on historical results.

Statistical Sampling : Selecting a subset of a population to inspect or analyze.

Purpose: Saves time and resources by analyzing part of the population instead of the whole. **Sample Size:** Depends on how representative and accurate the results need to be – larger samples usually give more reliable results.

Expert Help: Always consult a statistical expert to ensure proper sampling methods and valid analysis.

Testing Many IT projects view testing as a final step in product development. However, testing should occur during almost every phase of the development life cycle to ensure early detection of issues and improve quality.

ISO Standards (ISO 9000) is a quality system standard based on a continuous three-part cycle: planning, controlling, and documenting quality.

It sets the minimum requirements an organization must meet for quality certification.

Helps organizations worldwide reduce costs and improve customer satisfaction.

Improving IT Project Quality • Promote strong leadership focused on quality. • Understand and manage the cost of quality. • Address organizational and workplace factors impacting quality. • Use maturity models to guide quality improvements.

Leadership Joseph M. Juran (1945) emphasized that top management must be quality-minded for quality initiatives to succeed.

Many quality problems stem from management issues, not technical faults.

Effective leadership is crucial to drive and sustain quality improvements

Five Cost Categories Related to Quality

Prevention Cost: Costs to plan and execute a project to avoid errors or keep them within limits.

Appraisal Cost: Costs to evaluate processes and outputs to ensure quality.

Internal Failure Cost: Costs to fix defects found before delivering the product to the customer.

External Failure Cost: Costs from errors found after the product reaches the customer.

External Failure Cost: Costs from errors found after the product reaches the customer.

Measurement and Test Equipment Cost: Capital costs for equipment used in prevention and appraisal activities.

Organizational Influences, Workplace Factors, and Quality

DeMarco and Lister's study found organizational issues impact programmer productivity far more than technical tools or languages.

• Productivity varied up to 10 times between organizations, but only about 21% within the same organization.

• No clear link was found between productivity and programming language, experience, or salary.

• A dedicated, quiet workspace significantly improves programmer productivity.

Lec 6 - Risk Management

Importance of Project Risk Management It's the art and science of identifying, analyzing, and responding to risks throughout a project to help meet objectives.

Often overlooked, but crucial for improving project success by aiding project selection, defining scope, and creating realistic estimates.

Benefits of Software Risk Management • Improves project success rates. • Helps identify and mitigate potential problems early. • Supports better decision-making and resource allocation.

Negative Risk : Risk means the chance of loss or injury.

These are potential problems that might occur in a project and could block its success.

Risk Management: Managing negative risks is like having insurance—you prepare in advance to handle or avoid them. It's considered an investment in the project's success.

Risk Can Be Positive

Positive Risk (Opportunity): Some risks can lead to benefits or positive outcomes, such as gaining more value or success—these are called opportunities.

Project Risk (General): Project risk is any uncertainty that may affect project goals either positively or negatively.

Risk Management Goal: The aim is to reduce negative risks and enhance positive risks (opportunities) to improve project results.

Risk Utility (Risk Tolerance) is the level of satisfaction or benefit a person feels from a potential reward.

Types of Risk Attitudes: Risk-Averse: Prefers safety; satisfaction increases slowly with higher rewards.

Risk-Seeking: Comfortable with risk; satisfaction increases more when the reward is bigger.

Risk-Neutral: Makes decisions based on a balanced view of risk and reward, without being too cautious or too risky.

Project Risk Management Processes

Planning Risk Management Decide how to handle risk management in the project. Define the overall approach, tools, roles, and timing for managing risks.

Identifying Risks Find out which risks might affect the project. Document the details and characteristics of each identified risk.

Performing Qualitative Risk Analysis Prioritize risks based on their likelihood of happening and impact on the project. Helps to focus attention on high-priority risks.

Performing Quantitative Risk Analysis Use numerical data to estimate how risks may impact project objectives (like cost or time). Supports better decision-making using measurable risk values.

Planning Risk Responses Develop actions to increase positive risks (opportunities) and decrease negative risks (threats). Focus on maximizing success and reducing harm.

Controlling Risk Track existing risks, identify new risks, and implement response plans. Evaluate if strategies are working effectively throughout the project.

Planning Risk Management The main output is the Risk Management Plan. It defines how risks will be managed throughout the project.

The team should: Review project documents, Understand the organization's and sponsor's risk attitudes. The detail level of the plan depends on project size/complexity.

Risk Management Plan

Methodology - Tools and approaches used for risk management **Roles and Responsibilities** - Who will handle what **Budget and Schedule** - Resources and timelines for risk management **Risk Categories** - Types of risks (e.g., technical, financial) **Risk Probability and Impact** - How likely and how severe risks are **Stakeholder Tolerances** - Revised based on risk analysis **Tracking** - How risks will be monitored and updated **Risk Documentation** - How risks and responses will be recorded

Contingency, Fallback Plans & Reserves

Contingency Plan: Predefined action taken if a specific identified risk occurs. **Fallback Plan:** Backup action used if initial risk responses fail. **Contingency Reserves:** Set aside for known risks to handle cost/schedule overruns.

Management Reserves: For unknown, unpredictable risks.

Broad Categories of Risk

Market Risk - External market-related uncertainties

Financial Risk - Cost overruns, funding issues

Technology Risk - Technical failures or complexity

People Risk - Skill gaps, team turnover

Structure/Process Risk - Weak governance, poor processes

Risk Breakdown Structure (RBS) A hierarchical structure for organizing risk categories. Works like a Work Breakdown Structure (WBS) but focuses on risks. Helps identify, group, and analyze all potential risks in a structured way

Identifying Risks Identifying risks is the process of understanding what potential events might hurt or enhance a particular project. Another consideration is the likelihood of advanced discovery (how early a risk can be found).

Risk identification tools and techniques include:
Brainstorming

A group technique to generate ideas or solutions spontaneously and without judgment. Should be facilitated by an experienced person.

Use cautiously: Research shows individuals alone often generate more ideas than groups brainstorming face-to-face. Group dynamics can inhibit idea generation.

Delphi Technique Used to achieve consensus among experts predicting future developments. Experts provide independent and anonymous input. Involves multiple rounds of questionnaires and written feedback.

Avoids biases common in oral methods like brainstorming.

Interviewing A fact-finding method via face-to-face, phone, email, or instant messaging.

Interviewing those with relevant project experience is valuable for identifying risks.

Interviewing those with relevant project experience is valuable for identifying risks.

SWOT Analysis Analyzes Strengths, Weaknesses, Opportunities, and Threats. Useful for identifying both positive and negative risks affecting a project.

Risk Register

The main output of risk identification is a list of identified risks and related information needed to start creating a risk register.

A risk register is a document that records the results of risk management processes, usually shown as a table or spreadsheet.

It serves as a tool to document potential risk events—specific, uncertain occurrences that can negatively or positively affect the project.

Risk Register Contents

• An identification number for each risk event • A rank for each risk event • The name of each risk event • A description of each risk event • The category under which each risk event falls • The root cause of each risk • Triggers for each risk; triggers are indicators or symptoms of actual risk events. • Potential responses to each risk. • Therisk owner or person who will own or take responsibility for each risk. • Theprobability and impact of each risk occurring. • Thestatus of each risk.

Performing Qualitative Risk Analysis

Evaluate the likelihood (probability) and impact of each identified risk to determine its overall priority.

Common tools and techniques include:

Probability/Impact Matrix, Top Ten Risk Item Tracking, Expert Judgment

Probability/Impact Matrix

A matrix or chart where one axis shows the probability of a risk occurring and the other shows the impact if it occurs.

Each risk is rated as high, medium, or low for both probability and impact.

Allows calculation of risk factors, which combine probability and impact into a single number representing the overall risk level.

Performing Quantitative Risk Analysis

Usually done after qualitative analysis but can be done alongside it.

Essential for large, complex projects, especially with new or advanced technologies.

Key techniques include: Decision tree analysis, Simulation ,Sensitivity analysis

Decision Trees and Expected Monetary Value (EMV)

A decision tree is a diagram used to evaluate choices when future outcomes are uncertain.

Expected Monetary Value (EMV) = Probability of risk × Monetary impact of risk.

Decision trees help calculate EMV and select the best course of action

Planning Risk Responses After identifying and analyzing risks, decide how to respond.

Negative risk response strategies: Avoidance: Eliminate the risk cause. **Acceptance:** Acknowledge the risk without action. **Transference:** Shift the risk to a third party (e.g., insurance). **Mitigation:** Reduce the probability or impact.

Response Strategies for Positive Risks Exploitation: Ensure the opportunity happens. **Sharing:** Partner with others to maximize benefits. **Enhancement:** Increase the probability or impact of the opportunity. **Acceptance:** Recognize the opportunity but take no action.

Residual and Secondary Risks Residual risks: Remain after responses are applied. **Secondary risks:** New risks caused by implementing risk responses.

Controlling Risks Implement risk responses and maintain risk awareness throughout the project.

Workarounds: Unplanned risk responses when no contingency plan exists.

Main outputs: Work performance information, Change requests, Updates to project plans, documents, and organizational assets

Lec 7 - Stakeholder Management

Project Stakeholder Management Processes

Identifying Stakeholders: Recognize everyone involved in or affected by the project and figure out how best to manage relationships with them.

Planning Stakeholder Management: Develop strategies to engage stakeholders effectively throughout the project.

Managing Stakeholder Engagement: Communicate and collaborate with stakeholders to meet their needs, resolve issues, and encourage participation in decisions and activities.

Controlling Stakeholder Engagement: Monitor stakeholder relationships and update engagement plans as necessary to maintain positive interactions.

Identifying Stakeholders

• **Internal stakeholders include:** Project sponsor, project team, support staff, internal customers, top management, functional managers, and other project managers (due to shared resources).

• **External stakeholders include:** External customers, competitors, suppliers, and external groups affected by the project, such as government officials and concerned citizens.

Stakeholder Register

• A document with essential stakeholder information, **including:** - Identification information: Stakeholders' names, job titles, locations, roles in the project, and contact details.

Assessment information: Stakeholders' key requirements, expectations, level of influence, and the project phases they are most interested in.

Stakeholder classification: Identifies whether the stakeholder is internal or external, and whether they support or resist the project.

Classifying Stakeholders

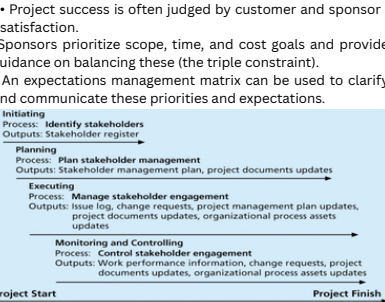
• After identifying key stakeholders, use classification models to guide management strategies. • A power/interest grid groups stakeholders by their authority (power) and their concern (interest) in project outcome

Planning Stakeholder Management

• After identifying and analyzing stakeholders, develop a plan to manage them effectively.

The stakeholder management plan may include:

- Current and desired engagement levels
 - Relationships between stakeholders
 - Communication needs and methods
 - Management strategies tailored for each stakeholder
 - Processes for updating the plan as the project progresses
- Managing Stakeholder Engagement**
- Project success is often judged by customer and sponsor satisfaction.
 - Sponsors prioritize scope, time, and cost goals and provide guidance on balancing these (the triple constraint).
 - An expectations management matrix can be used to clarify and communicate these priorities and expectations.



Issue Logs - Knowing stakeholders' expectations aids in managing project issues. • An issue log documents, monitors, and tracks issues needing resolution. • Unresolved issues can cause conflicts and unmet stakeholder expectations. • Issue logs can also support other project knowledge areas beyond stakeholder management.

Controlling Stakeholder Engagement

• You can't control stakeholders, but you can manage their level of engagement. • Engagement means ongoing dialogue to understand concerns and find solutions. • Setting the right tone early in the project is crucial for effective engagement.

Lec 8 - Project Selection

Strategic Planning & Project Selection

• Strategic planning sets long-term goals, anticipates future trends, and identifies the need for new products/services. • Organizations use SWOT analysis to assess Strengths, Weaknesses, Opportunities, and Threats.

• **As part of strategic planning, they:** - Identify potential project opportunities - Use objective methods to select viable projects - Formalize initiation by creating and issuing a project charter

Methods for Selecting Projects

• Organizations often have more projects than resources to complete them. • **Common selection methods include:** - Focusing on organizational needs (e.g., improving efficiency or compliance) - Categorizing IT projects (e.g., mandatory, operational, strategic) - Financial analysis (e.g., Net Present Value, ROI) - Weighted scoring models (prioritize projects based on multiple criteria)

- Balanced scorecard (aligns projects with strategic goals across multiple perspectives)

Focusing on Broad Organizational Needs

• Many IT projects are hard to justify with exact numbers, but their value is widely recognized. • "Better to measure gold roughly than count pennies precisely" – focus on big-picture benefits.

• **Key criteria for selecting such projects:** - Clear need for the project - Funds are available - Strong commitment to ensure success

Categorizing IT Projects

• Projects can be categorized by purpose: - Solving a problem - Seizing an opportunity - Responding to a directive • Other categorizations: - Duration and urgency - Overall priority in the organization

Financial Analysis of Projects

• Financial value is a key factor in project selection. • Three main methods: - Net Present Value (NPV) - Return on Investment (ROI) - Payback Period

Net Present Value (NPV) Analysis

• **NPV = Present value of future inflows - Present value of outflows**

• A positive NPV indicates a financially viable project. • Higher NPV means greater expected financial benefit.

Net Present Value (NPV) Calculations

• Estimate costs and benefits over the project/product lifetime. • Choose a discount rate (typically provided by the organization).

• **Calculate NPV = Present value of benefits - Present value of costs**

• Notes: - Investment year can be Year 0 or Year 1 (depends on org). - Costs may be entered as negative or positive—follow org standards.

• Higher NPV = more financially attractive project

Return on Investment (ROI)

• **ROI = (Total discounted benefits - Total discounted costs) / Discounted costs**

• Measures project profitability

• Higher ROI is better

• Many orgs require a minimum acceptable ROI • **IRR = Discount rate where NPV = 0** (used to compare profitability)

Payback Analysis

• Measures how long it takes to recover project investment • Payback = When cumulative discounted benefits = total costs • Shorter payback periods are often preferred, especially for IT projects

weighted Scoring Model

A systematic tool for selecting projects based on multiple criteria.

Steps: Identify important selection criteria, Assign weights to each criterion (must total 100%), Score each project against the criteria, Multiply scores by weights to get total weighted score.

Higher total score = more favorable project.

The Key to Project Success: Good Project Integration Management

Ensures coordination across all knowledge areas throughout the project life cycle.

Helps project managers see the big picture rather than just focusing on details.

Not the same as software/system integration.

Project Integration Management Processes

Develop Project Charter - Authorizes the project formally, created with stakeholder input.

Develop Project Management Plan - Integrates all planning outputs into one cohesive document.

Direct & Manage Project Work - Executes the plan by performing planned tasks.

Monitor & Control Project Work - Tracks progress to meet project performance goals.

Perform Integrated Change Control - Reviews, approves, and manages change requests.

Close Project or Phase - Finalizes all activities to formally close the project or a phase.

Performing Integrated Change Control

Main Objectives: Influence change factors to ensure benefits, identify when a change occurs, Manage changes as they happen.

Change Control in IT Projects

Old View: Stick rigidly to original plan.

Problem: Poor initial scope agreement and estimation.

Modern View: Project management = ongoing communication and negotiation. **Solution:** Embrace beneficial changes and plan for them.

Change Control System

A formal, documented process for handling changes.

Defines:

When/how documents or work can change.

Who is authorized to make those changes.

Change Control Board (CCB)

Formal group to approve/reject change requests.

Responsibilities:

Set guidelines for change requests.

Evaluate and manage implementation of changes.

Includes key stakeholders.

Making Timely Changes

Problem: Infrequent CCB meetings may delay changes.

Solutions:

Use a "48-hour policy": Temporary decisions can be reversed within 48 hours if needed.

Delegate decisions to lower levels but inform all stakeholders.

Configuration Management Ensures project product descriptions are complete and accurate.

Activities: Identify and control design and support documentation, Record