

Project Procurement and Supply Chain

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PMG 433

Lecture 10



Project changes: Sources, Impacts, Mitigation, Pricing, Litigation, and Excellence & Key Trends in Project Management.

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Course Agenda

Chapter

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1. Define project change.
 2. Explain why changes occur during projects.
 3. Understand the importance of effective change management.
 4. Recognize the impact of uncontrolled changes on project success.
 5. Describe how changes may impact the project.
 6. Explaining the best ways of managing contracts.
 7. Describe the best ways of managing the project.
 8. Discuss how to manage the contractor-customer relationship.
 9. Key Trends in Project Management.

Meaning of Project Change (PMBOK)

- According to the **A Guide to the Project Management Body of Knowledge (PMBOK® Guide)**, **project change** refers to
- Any modification to an approved project baseline or project management plan.
- Changes may affect the project scope, schedule, cost, quality, design, resources, risks, procurement, or stakeholder engagement.
- Since projects operate in dynamic environments, change is expected and should be managed in a structured and controlled manner.
- Change is a necessary fact in the project life cycle.

What is Project Change?

A project change is any modification to the approved project baseline or plan after the project has started.

Changes may affect one or more aspects of the project, including:

- **Scope** – adding, removing, or modifying project deliverables.
- **Schedule** – changing project timelines or milestones.
- **Cost** – increasing or decreasing the project budget.
- **Quality** – altering quality standards or specifications.
- **Resources** – changing personnel, equipment, or materials.
- **Risks** – introducing new risks or changing existing ones.

Effective project change management helps organizations:

1. Maintain Project Control

Ensures that all changes are evaluated before implementation.

2. Protect Project Objectives

Keeps the project aligned with its intended scope, schedule, cost, and quality.

3. Reduce Risks

Identifies potential impacts before approving changes.

4. Improve Decision-Making

Provides management with sufficient information to approve, reject, or defer changes.

5. Enhance Stakeholder Communication

Ensures everyone understands the reasons for changes and their impacts.

6. Minimize Cost Overruns

Prevents unnecessary spending caused by uncontrolled modifications.

7. Prevent Schedule Delays

Assesses timeline impacts before implementing changes.

8. Improve Documentation

Maintains a complete record of approved changes for future reference and auditing.

Effective change management requires balancing contractual obligations with organizational objectives and stakeholder expectations

Examples of Project Changes

Type of Change

Scope Change

Schedule Change

Cost Change

Quality Change

Resource Change

Procurement Change

Risk Response Change

Example

Adding a new project feature

Extending the completion date

Increasing the project budget

Introducing higher quality standards

Assigning additional engineers

Changing a supplier or contract terms

Implementing a new mitigation strategy

Examples of Project Changes

Project	Change
Construction	Client requests an additional parking level
Software Development	Customer requests a mobile application after development begins
Manufacturing	New government safety regulations require product redesign
Infrastructure	Material shortages require alternative suppliers

1. Project Scope

Changes often modify the project's deliverables or requirements.

Impact

- Addition of new features or services
- Removal of planned work
- Changes in technical specifications
- Increased project complexity

Example

A client requests additional reporting features in an ERP implementation.

2. Project Schedule

Changes usually require adjustments to the project timeline.

Impact

- Delayed milestones
- Extended project duration
- Rescheduling activities
- Increased dependency conflicts

Example

Adding a new production line extends the construction schedule by two months.

3. Project Cost

Most project changes influence the project budget.

Impact

- Increased labor costs
- Additional materials
- Equipment purchases
- Higher subcontractor expenses

Example

Using premium materials increases the project budget by 15%.

4. Project Quality

Changes may improve or reduce quality depending on implementation.

Positive Impact

- Better performance
- Improved customer satisfaction
- Enhanced reliability

Negative Impact

- Reduced testing time
- Increased defects
- Lower product quality

5. Project Resources

Changes often require different or additional resources.

Impact

- More personnel
- Additional equipment
- Specialized expertise
- Resource conflicts

6. Project Risks

Every change introduces new uncertainties.

Possible Effects

- New technical risks
- Supplier risks
- Financial risks
- Operational risks

7. Stakeholder Satisfaction

Properly managed changes improve stakeholder confidence.

Poorly managed changes may result in:

- Customer dissatisfaction
- Team frustration
- Sponsor concerns
- Reduced stakeholder trust

8. Procurement and Contracts

Changes frequently affect procurement activities.

Examples include:

- New purchase orders
- Contract amendments
- Additional suppliers
- Contract extensions
- Price renegotiations

Example

A construction project is approved to build a **10-story office building**. During construction, the client requests **two additional floors**.

Under PMBOK, the project manager should:

1. Document the change request.
2. Assess impacts on scope, schedule, cost, quality, risks, and resources.
3. Present the analysis for approval.
4. Update the project baselines if the change is approved.
5. Execute the revised project plan.

This structured approach ensures the project remains controlled rather than allowing uncontrolled scope changes.

Apple – Product Development Change

Project: Development of a new iPhone model

Original Plan:

- Launch with a standard camera system.

Change:

- Engineers develop a new AI-powered camera feature before production.

Impact:

- Scope increases.
- Additional software development.
- Higher testing costs.
- Launch delayed by one month.

PMBOK Response:

- Submit a change request.
- Analyze cost, schedule, and quality impacts.
- Obtain approval before implementation.

Tesla – Manufacturing Project

Project: Building a new vehicle manufacturing line.

Original Plan:

- Produce 3,000 vehicles per week.

Change:

- Management decides to automate additional production processes.

Impact:

- New robotic equipment required.
- Increased project budget.
- Construction schedule extended.
- Higher long-term productivity.

Amazon – Warehouse Expansion

Project: Construction of a new fulfillment center.

Original Plan:

- Manual sorting systems.

Change:

- Introduce autonomous warehouse robots.

Impact:

- Additional procurement.
- Employee retraining.
- Budget increases.
- Faster order fulfillment after project completion.

Positive Impacts of Project Changes

Positive Impact

Improved Project Outcomes

Explanation

Changes can enhance the final product or service.

Example

Adding advanced security features to a banking application.

Greater Customer Satisfaction

Incorporating customer feedback results in a product that better meets user needs.

A client requests a mobile app feature that improves usability.

Higher Product Quality

Changes may improve reliability, durability, or performance.

Using higher-quality materials in a construction project.

Innovation

New technologies or methods can improve efficiency and competitiveness.

Introducing AI to automate quality inspections in manufacturing.

Better Risk Management

Changes can reduce project risks when new threats are identified.

Installing backup servers after identifying cybersecurity risks.

Regulatory Compliance

Changes ensure compliance with new laws or industry standards.

Updating a medical device to meet revised safety regulations.

Increased Operational Efficiency

Process improvements can reduce waste and increase productivity.

Automating inventory management in a warehouse.

Competitive Advantage

Improved products can strengthen the organization's market position.

Adding sustainability features to attract environmentally conscious customers.

Negative Impacts of Project Changes

Negative Impact	Explanation	Example
Scope Creep	Uncontrolled additions increase project complexity without proper approval.	Continuously adding software features during development.
Schedule Delays	Additional work often extends the project timeline.	Redesigning a bridge after construction has started.
Cost Overruns	Extra resources, materials, or labor increase the project budget.	Purchasing more equipment after changing project requirements.
Resource Conflicts	More personnel or equipment may be required than originally planned.	Engineers are reassigned from other critical projects.
Reduced Productivity	Frequent changes interrupt work and reduce team efficiency.	Developers repeatedly revise completed work.
Increased Risks	New changes may introduce technical, financial, or operational risks.	Integrating untested technology into an existing system.
Quality Problems	Poorly managed changes may introduce defects or reduce product reliability.	Rushing implementation to meet deadlines.
Stakeholder Conflicts	Different stakeholders may disagree about proposed changes.	Marketing wants new features while finance wants to reduce costs.
Procurement Issues	New suppliers or contract modifications may delay project execution.	Changing suppliers due to material shortages.

Mitigation Strategies

Mitigation Strategy

Integrated Change Control

Impact Analysis

Risk Management

Stakeholder Communication

Configuration Management

Contingency Reserves

Strong Documentation

Change Control Board (CCB)

Continuous Monitoring

Purpose

Evaluate and approve all changes before implementation.

Assess effects on scope, cost, schedule, quality, and risks.

Identify and respond to risks introduced by changes.

Keep all stakeholders informed of approved changes.

Maintain version control for project documents and deliverables.

Allocate additional time and budget for unforeseen changes.

Record all decisions, approvals, and modifications.

Review significant change requests and make approval decisions.

Track implementation and verify expected benefits are achieved.

Common Causes of Litigation

Cause	Example
Unapproved Changes	Contractor performs work without formal approval.
Contract Ambiguities	Unclear contract clauses regarding changes.
Payment Disputes	Client refuses to pay for additional work.
Delays	Contractor claims compensation for owner-caused delays.
Defective Work	Client alleges poor quality after modifications.
Scope Disagreements	Parties disagree on whether work is part of the original contract.

- Clear contracts
- Detailed scope statements
- Formal change requests
- Comprehensive documentation
- Regular communication
- Timely approvals
- Proper record keeping
- Early dispute resolution

Practice

Establish a Formal Change Management Process

Perform Impact Analysis

Use Digital Project Management Tools

Involve Stakeholders Early

Train Project Teams

Maintain Complete Documentation

Monitor Key Performance Indicators (KPIs)

Conduct Lessons Learned Reviews

Foster Continuous Improvement

Benefit

Prevents uncontrolled changes.

Supports informed decision-making.

Improves visibility and tracking.

Builds commitment and reduces resistance.

Improves change management capability.

Provides traceability and accountability.

Measures the effectiveness of implemented changes.

Improves future project performance.

Enhances organizational maturity and project success.

The Top Ten Causes of Project Productivity Loss

Project productivity loss occurs when a project requires more time, effort, or resources than planned to complete the same amount of work.

According to project management best practices (**including PMBOK principles**), identifying these causes early helps project managers reduce delays, control costs, and improve project performance.

The Top Ten Causes of Project Productivity Loss

Rank	Cause	Description	Example
1	Scope Changes (Scope Creep)	Uncontrolled additions or modifications to project requirements without proper approval.	A client repeatedly requests new software features after development has started.
2	Poor Planning	Incomplete planning results in unrealistic schedules, budgets, and resource allocation.	Construction begins before all design drawings are completed.
3	Poor Communication	Ineffective communication leads to misunderstandings, errors, and duplicated work.	Different departments work from outdated project documents.
4	Resource Shortages	Insufficient labor, equipment, or materials reduce work efficiency.	A project lacks enough qualified engineers during critical phases.
5	Frequent Design Changes	Repeated design revisions cause rework and schedule disruptions.	Architectural drawings are revised after construction has started.
6	Poor Decision-Making	Delayed or ineffective decisions slow project progress.	Management takes weeks to approve a supplier selection.
7	Low Team Skills or Training	Inexperienced team members require more time and produce lower-quality work.	Workers need additional training to operate new machinery.
8	Supplier and Procurement Delays	Late delivery of materials or equipment interrupts project activities.	Steel deliveries arrive one month later than scheduled.
9	Poor Risk Management	Failure to identify and manage risks leads to unexpected problems.	A project has no contingency plan for severe weather conditions.
10	Low Employee Motivation	Poor morale and lack of engagement reduce productivity and work quality.	High employee turnover results in constant onboarding of new staff.

- In project management, a **dispute** is a disagreement between two or more parties regarding project obligations, contract terms, performance, payments, schedules, quality, or responsibilities.
- If disputes are not resolved promptly, they can escalate into **claims**, **arbitration**, or **litigation**, leading to project delays, increased costs, and damaged business relationships.
- According to the **A Guide to the Project Management Body of Knowledge (PMBOK® Guide)**, effective contract management, communication, and change control are essential for preventing and resolving disputes.

Types of Project Disputes

- **Contractual Disputes**
 - Interpretation of contract terms.
 - Responsibilities and obligations.
- **Financial Disputes**
 - Payment delays.
 - Cost overruns.
 - Claims for additional compensation.
- **Technical Disputes**
 - Design specifications.
 - Engineering solutions.
 - Quality standards.
- **Schedule Disputes**
 - Project delays.
 - Extension of time claims.
 - Acceleration costs.
- **Performance Disputes**
 - Failure to meet agreed performance requirements.
 - Failure to achieve project objectives

Dispute Resolution Methods

Method	Description	Advantages
Negotiation	Parties discuss the issue and seek a mutually acceptable solution.	Fast, inexpensive, preserves relationships.
Mediation	A neutral third party facilitates discussions but does not impose a decision.	Confidential, collaborative, flexible.
Arbitration	An independent arbitrator hears both sides and issues a binding or non-binding decision, depending on the agreement.	Faster and usually less formal than court litigation.
Litigation	The dispute is resolved through the court system.	Provides a legally enforceable judgment but is typically the most expensive and time-consuming option.

- **The process areas that are keys to success in handling change are as follows:**
 - Managing the contract
 - Managing the project
 - Managing the contractor-customer relationship

Managing the Contract

- **Contract management** is the process of planning, administering, monitoring, controlling, and closing a contract to ensure that all contractual obligations are fulfilled by both the buyer (customer) and the seller (contractor).
- **The primary objective** is to ensure compliance with the agreed scope, schedule, cost, quality, and legal terms while minimizing risks and disputes.

Managing the Contract

Activity

Contract Administration

Change Management

Performance Monitoring

Payment Administration

Claims Management

Risk Management

Documentation

Contract Closeout

Description

Monitor compliance with contract terms.

Process and approve contract modifications (change orders).

Measure contractor performance against agreed KPIs.

Verify completed work before approving payments.

Evaluate and resolve claims arising during project execution.

Identify and mitigate contractual risks.

Maintain records of correspondence, approvals, and amendments.

Confirm completion of all obligations and finalize the contract.

Example

A contractor is awarded a contract to build a school for **\$20 million** within **18 months**.
During execution, the contract manager:

- Reviews monthly progress reports.
- Verifies completed work before approving payments.
- Processes approved change orders.
- Ensures the contractor meets contractual quality standards.
- Finalizes the contract after successful completion.

- **Project management** is the process of planning, organizing, leading, monitoring, and controlling project activities to achieve the project's objectives within the approved scope, schedule, budget, and quality standards.
- According to the **A Guide to the Project Management Body of Knowledge (PMBOK® Guide)**, project management integrates people, processes, and resources to deliver value.

Managing the Project

Activity

Scope Management

Schedule Management

Cost Management

Quality Management

Resource Management

Risk Management

Communication Management

Performance Monitoring

Description

Define and control project deliverables.

Develop and monitor the project timeline.

Estimate, budget, and control project costs.

Ensure deliverables meet specifications.

Allocate and manage people, equipment, and materials.

Identify, analyze, and respond to project risks.

Share project information with stakeholders.

Measure project progress using KPIs and reports.

Example

An ERP implementation project includes:

- Developing a project schedule.
- Assigning implementation teams.
- Monitoring milestones.
- Managing risks and issues.
- Tracking project costs.
- Delivering the system according to customer requirements.

Definition

Relationship management focuses on creating and maintaining a **collaborative, transparent, and mutually beneficial partnership** between the contractor and the customer throughout the project life cycle.

Strong relationships improve communication, reduce conflicts, and contribute to project success.

Activity

Communication

Stakeholder Engagement

Conflict Resolution

Performance Reviews

Issue Management

Change Discussions

Relationship Building

Description

Conduct regular meetings and provide project updates.

Involve key stakeholders in important decisions.

Address disagreements early and constructively.

Evaluate contractor performance against agreed metrics.

Resolve problems before they escalate.

Collaborate on evaluating and implementing changes.

Foster teamwork and openness between parties.

Example

In a road construction project:

- Weekly meetings are held between the client and contractor.
- Both parties review progress and discuss risks.
- Design issues are resolved collaboratively.
- Transparent communication helps avoid disputes and delays.

Summary

- **Project change** is a normal and expected part of project management.
- The objective is **not to prevent change but to manage it systematically**.
- A structured change management process ensures that changes contribute positively to project success while minimizing disruptions, controlling costs, maintaining schedules, and meeting stakeholder expectations.

Summary

- **Sources:** Customers, regulations, technology, risks, suppliers, resources, and organizational changes.
- **Impacts:** Changes affect scope, schedule, cost, quality, resources, risks, procurement, and stakeholders.
- **Mitigation:** Use Integrated Change Control, impact analysis, risk management, communication, and documentation.
- **Pricing:** Apply appropriate pricing methods such as fixed price adjustments, unit rates, time and materials, or negotiated pricing.
- **Litigation:** Most disputes stem from unclear contracts, undocumented changes, payment issues, and delays; they can often be avoided through proper contract administration and documentation.
- **Excellence:** Organizations achieve superior project performance by implementing structured change management, engaging stakeholders, capturing lessons learned, and continuously improving their processes.

To maximize the benefits and minimize the drawbacks of project changes, the PMBOK recommends:

1. Document every change request.
2. Assess impacts on scope, schedule, cost, quality, resources, risks, procurement, and stakeholders.
3. Obtain formal approval before implementation.
4. Update project baselines and documentation.
5. Communicate approved changes to all relevant stakeholders.
6. Monitor implementation to ensure the change delivers the expected benefits.

1. Widespread Adoption of AI & Automation

- Artificial intelligence is now becoming a core tool in project management not just a “nice-to-have.”
- AI-driven tools can automate routine tasks such as scheduling, resource allocation, progress tracking, reporting, and even risk detection.
- Predictive analytics help forecast delays, resource bottlenecks, or cost overruns — giving project managers a chance to intervene before issues escalate.
- This automation and AI-assisted decision-making frees up more time for strategic tasks, innovation, and value-added leadership rather than repetitive admin work.

2. Rise of Hybrid Methodologies (Agile + Traditional + Custom)

Rather than sticking strictly to classic Waterfall or strictly Agile, many teams now adopt “hybrid” frameworks — blending structure and predictability with flexibility and rapid iteration.

1. Hybrid approaches allow tailoring based on project type — some parts follow Agile (flexible, iterative), other parts follow more traditional planning — useful especially in larger or more regulated projects.
2. This adaptability helps organizations respond to changing requirements, uncertainty, or evolving stakeholder needs more effectively.

3. Remote & Hybrid Work — and Distributed Teams

Remote or hybrid team setups have become a permanent fixture. Managers now often handle teams distributed across locations and time zones.

This drives the need for strong digital collaboration tools, real-time (or asynchronous) communication, and virtual leadership skills.

Project management tools increasingly support cloud-based workflows, shared dashboards, and integrations making coordination easier regardless of physical location.

4. Sustainability and ESG Integration

Environmental, Social, and Governance (ESG) considerations are becoming part of project planning and execution.

Examples

- Green construction
- Renewable energy projects
- Waste reduction
- Sustainable procurement
- Carbon footprint reduction

Benefits

- Regulatory compliance
- Corporate reputation
- Long-term value creation

5. Cybersecurity and Digital Risk Management

As projects become increasingly digital, protecting project information has become a priority.

Focus Areas

- Data security
- Access control
- Cyber risk assessment
- Secure collaboration platforms

6. Emphasis on Collaboration, Communication & Stakeholder Engagement

- With distributed teams and hybrid work, collaboration tools, transparent communication, and stakeholder engagement become critical for success.
- As projects and stakeholders grow more diverse, cross-functional collaboration (across departments, disciplines) is increasingly important.
- Virtual collaboration — real-time dashboards, remote updates, asynchronous progress tracking — is now standard rather than exceptional.

Trend	Impact on Project Management
Agile and Hybrid Methods	Greater flexibility and faster delivery
Artificial Intelligence	Better forecasting and automation
Digital Collaboration Tools	Improved teamwork and communication
Data Analytics	Data-driven decision-making
Sustainability (ESG)	Responsible and sustainable project delivery
Remote Teams	Increased global collaboration
Advanced Risk Management	Better project resilience
Stakeholder Engagement	Higher customer satisfaction
Value Delivery	Focus on business outcomes rather than outputs
Cybersecurity	Better protection of project data
Portfolio Management	Improved strategic alignment
Leadership and Soft Skills	Stronger team performance and stakeholder relationships

Summary of Learning Objectives

Chapter

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1. Define project change.
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Thank You