

Project Procurement and Supply Chain

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PMG 433

Lecture 9





Contract Management in Projects

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Course Agenda

Chapter



1. Explain the role of contract management in project success.
2. Understand the project contract life cycle.
3. Differentiate between contract administration and procurement.
4. Identify contract risks.
5. Select appropriate contract types.
6. Manage supplier performance.
7. Handle contract changes and claims.
8. Close contracts successfully.
9. Apply PMBOK practices to real projects.

Contract Management is

- **The systematic process** of planning, creating, executing, monitoring, controlling, modifying, and closing contracts to ensure that both parties fulfill their contractual obligations.
- **Effective contract management** requires balancing legal compliance, commercial objectives, and supplier relationships.

It ensures

- Scope is delivered
- Cost is controlled
- Time commitments are met
- Risks are minimized
- Legal obligations are fulfilled

PMBOK Perspective

Within PMBOK, contract management belongs to

Project Procurement Management

Processes include

- Plan Procurement Management
- Conduct Procurements
- Control Procurements

Contract Management mainly occurs during **Control Procurements**

Why is Contract Management Important?

Poor contract management causes

- Cost overruns
- Project delays
- Claims
- Litigation
- Supplier disputes
- Poor quality
- Financial losses

Real Example

Construction Project

Contract Value

\$100 Million

Because of poor contract administration

- Variation orders not documented
- Delayed approvals
- Supplier disputes

Final Cost

\$127 Million

Lessons

Contract management protects project profitability.

Procurement Management in PMBOK

Project Procurement Management includes

Planning



Selecting suppliers



Awarding contracts



Managing contracts



Closing contracts

Procurement vs Contract Management

Procurement

- Selecting suppliers
- Tendering
- Bid evaluation
- Contract award
- Supplier selection

Contract Management

- Managing suppliers
- Contract execution
- Performance monitoring
- Claims management
- Contract closeout

Typical Contract Life Cycle

Need Identification



Planning



Tendering



Evaluation



Negotiation



Contract Award



Execution



Monitoring



Changes



Closeout

A. Fixed Price Contracts

Seller assumes most risk.

Examples

- Lump Sum Contract
- Firm Fixed Price (FFP)
- Fixed Price Incentive Fee (FPIF)
- Fixed Price with Economic Price Adjustment (FPEPA)

Advantages

- Cost certainty
- Easier budgeting

Disadvantages

- Less flexibility
- Supplier may increase price to cover risks

Example

Building office furniture

Fixed Price

\$200,000

1. Boeing – Aircraft Component Manufacturing

Project

Manufacturing aircraft landing gear components.

Contract Type

Firm Fixed Price (FFP)

Example

Boeing contracts a supplier to manufacture **100 landing gear assemblies** for the **Boeing 737**.

- Contract Price: **\$25 million**
- Delivery: 12 months
- Technical specifications are fully defined.

If steel prices increase or production costs rise, the supplier absorbs the additional costs.

Why Fixed Price?

- Specifications are well defined.
- Quantities are known.
- Manufacturing process is standardized.
- Buyer wants cost certainty.

Risk Allocation

Buyer Risk → Low

Seller Risk → High

2. Toyota – Automotive Parts Procurement

Project

Supplying brake systems for a new vehicle model.

Contract

Firm Fixed Price

Toyota signs a contract with a brake supplier to deliver

- 50,000 brake systems
- Price: **\$180 per unit**

Even if the supplier's manufacturing costs increase, Toyota pays the agreed contract price.

Lesson

Stable production environments favor fixed-price contracts.

B. Cost Reimbursable Contracts

Buyer pays actual costs plus fee.

Examples

- Cost Plus Fixed Fee
- Cost Plus Incentive Fee
- Cost Plus Award Fee

Advantages

- Flexible
- Suitable for R&D

Disadvantages

- Buyer bears higher financial risk

Pfizer – Pharmaceutical Research

Project

Development of a new vaccine or medicine.

Research organizations and biotechnology partners often work under cost-reimbursable research agreements because:

- Clinical trials may expand.
- Research duration is uncertain.
- Additional laboratory work may be required.

Actual research costs are reimbursed while performance incentives may be added for meeting milestones.

Boeing – New Aircraft Development

During the research and development phase of new military aircraft programs, Boeing may work under cost-reimbursable contracts funded by government agencies.

Why?

- Prototype design evolves continuously.
- Engineering solutions are unknown.
- Testing frequently results in redesign.

Once production begins, contracts often shift to Fixed Price.

C. Time and Material Contracts

Combination of

- Fixed labor rates
- Variable quantities

Suitable for

- Consulting
 - Maintenance
 - IT Support
-
- Time and Material contracts are suitable when project scope is expected to evolve and are not clearly defined.

IBM – Cloud Migration Projects

Project

Migrating a company's data center to IBM Cloud.

Contract

Time and Material

IBM charges for:

- Cloud engineers
- Cybersecurity specialists
- Database administrators
- Travel expenses (if applicable)

Because migration complexity becomes clear only after work begins, billing is based on actual effort.

Microsoft – IT Consulting Services

Project

Implementation of Microsoft Dynamics 365 ERP.

Contract Type

Time and Material (T&M)

Example

A manufacturing company hires **Accenture** to implement Microsoft Dynamics 365.

- ERP Consultant: **\$180/hour**
- Technical Architect: **\$250/hour**
- Actual software configuration hours billed monthly.

Since user requirements evolve during implementation, the total number of consulting hours cannot be accurately estimated in advance.

Contract Risk Allocation

Contract Type	Buyer Risk	Seller Risk
Fixed Price	Low	High
Cost Reimbursable	High	Low
Time & Material	Medium	Medium

Contract administration ensures

- Supplier complies with contract
- Deliverables meet specifications
- Milestones are achieved
- Payments are justified
- Risks are managed

Major Activities

Monitor

- Scope
- Schedule
- Cost
- Quality
- Safety
- Compliance

Approve

- Deliverables
- Invoices
- Variations

Document

- Meetings
- Correspondence
- Performance reports

Key Documents

- Contract Agreement
- Statement of Work (SOW) (describes the work that the contractor must perform)
- Technical Specifications
- Schedule
- Performance Reports
- Inspection Reports
- Payment Certificates
- Change Orders

Key Performance Indicators (KPIs)

- Cost Variance
- Schedule Variance
- Delivery Performance
- Quality Performance
- Defect Rate
- Response Time
- Safety Performance
- Customer Satisfaction

Example

Supplier promised
95% On-Time Delivery

Actual

81%

Methods include

- Site inspections
- Audits
- Progress meetings
- Performance scorecards
- Earned Value Management (EVM)
- Dashboards

Changes occur because of

- Design modifications
- Scope increase
- New regulations
- Client requests
- Unforeseen conditions

PMBOK Principle

Every contract change must follow the formal change control process, supported by formal documentation .

Change Order Process

Request



Evaluation



Impact Analysis



Approval



Contract Amendment



Implementation

Claim

A formal request seeking compensation for additional cost, time, or other contractual relief due to events affecting contract performance.

Common Claims

- Delay claims
- Acceleration claims
- Scope changes
- Design errors
- Force majeure
- Payment disputes

Claims Process

Identify



Notify



Document



Evaluate



Negotiate



Resolve

Examples

- Supplier Bankruptcy
- Late Delivery
- Inflation
- Currency Changes
- Political Risks
- Natural Disasters
- Technology Failure
- Poor Quality

Contract risks should be identified and managed throughout the project life cycle.

- Avoid
- Mitigate
- Transfer
- Accept
- Example
- Performance Bond
- Transfers financial risk.

Reasons

- Ambiguous specifications
- Late payments
- Scope changes
- Poor communication
- Schedule delays
- Poor documentation

Dispute Resolution Methods

Negotiation



Mediation



Arbitration



Litigation

Activities

- Confirm work completion
- Final inspection
- Final payment
- Release retention
- Archive documents
- Lessons learned
- Supplier evaluation
- Formal acceptance
- Contract closure certificate

- ✓ Deliverables accepted
- ✓ Final invoice approved
- ✓ Claims resolved
- ✓ Warranties documented
- ✓ Records archived
- ✓ Supplier evaluation completed
- ✓ Contract officially closed

Construction

- Large EPC contractors use milestone-based payments tied to engineer-certified progress, with change orders managed through formal approval workflows.

Information Technology

- Software implementation projects often use Time & Material contracts during requirements discovery and Fixed Price contracts for well-defined deployment phases.

Oil & Gas

- Offshore engineering projects rely on rigorous claims management because weather delays, design revisions, and regulatory changes can significantly affect cost and schedule.

Manufacturing

- Automotive manufacturers monitor supplier performance using KPIs such as on-time delivery, defect rates (PPM), responsiveness, and corrective action effectiveness.

Common Causes of Contract Failure

- Poorly defined scope
- Weak specifications
- Inadequate risk allocation
- Poor communication
- Lack of documentation
- Ineffective change management
- Delayed decisions
- Failure to monitor supplier performance
- Unrealistic schedules Inadequate stakeholder involvement

Best Practices (PMBOK-Aligned)

- Develop clear Statements of Work (SOWs).
- Select the contract type that best aligns with project risk.
- Define measurable KPIs before contract award.
- Monitor performance continuously.
- Use formal change control for all contract modifications.
- Keep complete and accurate contract records.
- Address issues and claims promptly.
- Conduct regular supplier performance reviews.
- Capture lessons learned at contract closeout.

Summary of Learning Objectives

Chapter



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- Morris, P. W., & Pinto, J. K. (Eds.). (2007). The Wiley guide to project technology, supply chain, and procurement management (Vol. 4). John Wiley & Sons.
- Schwalbe, K. (2015). Information technology project management. Cengage Learning.
- Baily, P., Farmer, D., Crocker, B., Jessop, D., & Jones, D. (2008). *Procurement principles and management*. Pearson Education.
- Supply Chain Council
- PMBOK® Guide (Project Management Body of Knowledge),



Thank You