MASTER OF COMPUTER SCIENCE/
MASTER OF SCIENCE IN COMPUTER SCIENCE

MCS4204- Software Project Management

Topic 9: Project Procurement Management

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Project Procurement Management

- Defines the processes necessary to purchase or acquire products, services, or results needed from outside the project team.
- Includes management and control processes required to develop and administer agreements.
- Significant legal obligations and penalties can be tied to the procurement process.
- PM must involve in the creation of the agreements. But he/she may not have the authority to sign the agreement.
- PM does not have to be a trained expert in procurement management laws and regulations but should be familiar enough with the procurement process to make intelligent decisions regarding contracts and contractual relationships.

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Project Procurement Management Overview

12.1 Plan Procurement Management

.1 Inputs
- .1 Project charter
- .2 Business documents
- .3 Project management plan
- .4 Project documents
- .5 Enterprise environmental factors
- .6 Organizational process assets

.2 Tools & Techniques
- .1 Expert judgment
- .2 Data gathering
- .3 Data analysis
- .4 Source selection analysis
- .5 Meetings

.3 Outputs
- .1 Procurement management plan
- .2 Procurement strategy
- .3 Bid documents
- .4 Procurement statement of work
- .5 Source selection criteria
- .6 Make-or-buy decisions
- .7 Independent cost estimates
- .8 Change requests
- .9 Project documents updates
- .10 Organizational process assets updates

12.2 Conduct Procurements

.1 Inputs
- .1 Project management plan
- .2 Project documents
- .3 Procurement documentation
- .4 Seller proposals
- .5 Enterprise environmental factors
- .6 Organizational process assets

.2 Tools & Techniques
- .1 Expert judgment
- .2 Advertising
- .3 Bidder conferences
- .4 Data analysis
- .5 Interpersonal and team skills

.3 Outputs
- .1 Selected sellers
- .2 Agreements
- .3 Change requests
- .4 Project management plan updates
- .5 Project documents updates
- .6 Organizational process assets updates

12.3 Control Procurements

.1 Inputs
- .1 Project management plan
- .2 Project documents
- .3 Agreements
- .4 Procurement documentation
- .5 Approved change requests
- .6 Work performance data
- .7 Enterprise environmental factors
- .8 Organizational process assets

.2 Tools & Techniques
- .1 Expert judgment
- .2 Claims administration
- .3 Data analysis
- .4 Inspection
- .5 Audits

.3 Outputs
- .1 Closed procurements
- .2 Work performance information
- .3 Procurement documentation updates
- .4 Change requests
- .5 Project management plan updates
- .6 Project documents updates
- .7 Organizational process assets updates

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Procurement Management processes

Planning

1. **Plan Procurement Management Process**
   - i. Document project procurement decisions
   - ii. Specify the approach
   - iii. Identify potential sellers

Execution

2. **Conduct Procurement Process**
   - i. Obtain seller responses,
   - ii. Select a seller
   - iii. Award the contract

Monitoring And Controlling

3. **Control Procurement Process**
   - i. Manage procurement relationships
   - ii. Monitor contract performance
   - iii. Make changes and corrections as appropriate
   - iv. Close out contracts

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Buyer & Seller / Product Owner & Contractor

- The seller may be identified as a contractor, vendor, service provider or supplier. During the contract life cycle, the seller may be viewed,
  - first as a bidder
  - next, as the selected source
  - finally, as the contracted supplier or vendor

- Buyer may be
  - a service requestor
  - the acquiring organization
  - the purchaser
  - the final product owner

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Agreements and contracts

Basis	Agreement	Contract
Meaning	The meaning of agreement can be understood as an acceptance of an offer given by one party to another.	A contract can be defined as an agreement that is enforced by law.
Written Form	The agreement can not necessarily be in written form.	A contract is normally written and registered.
Scope	An agreement has a wider scope than a contract.	A contract has a narrower scope as compared to an agreement.
Elements	Agreement = Offer + Acceptance	Contract = Agreement + Enforceable by Law

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Activity 1

- Define the following terms and discuss their differences.

1. Contracts and agreements
2. Service-Level Agreement (SLA) and Service-Level Commitment (SLC)
3. Memorandum of Understanding (MOU) and Memorandum of Agreement (MOA)

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Three Major Contract Types

All legal contractual relationships generally fall into one of two broad families:

1. Fixed-price
2. Cost-reimbursable

3. Hybrid type: Time and Materials contract

Fixed Price Contracts

Cost Reimbursable Contracts

Time & Material Contracts

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Fixed-Price Contracts

- involves setting a fixed total price for a defined product, service, or result to be provided.
- should be used when the requirements are well defined and no significant changes to the scope are expected.
- Types of fixed-price contracts include:
  1. Firm fixed price (FFP)
  2. Fixed price incentive fee (FPIF)
  3. Fixed price with economic price adjustments (FPEPA)

Firm Fixed Price (FFP):

- The price for goods is set at the outset and not subject to change unless the scope of work changes.
- The most commonly used type
- It is favored by most buying organizations

Fixed Price Incentive Fee (FPIF)

- Gives the buyer and seller some flexibility allowing for deviation from performance, with financial incentives tied to achieving agreed-upon metrics.
- Typically, such financial incentives are related to the cost, schedule, or technical performance of the seller.
- Under FPIF contracts, a price ceiling is set, and all costs above the price ceiling are the responsibility of the seller.

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Fixed Price with Economic Price Adjustments (FPEPA)

- This type is used whenever the seller's performance period spans a considerable period of years, or if the payments are made in a different currency.
- It is a fixed-price contract, but with a special provision allowing for predefined final adjustments to the contract price due to changed conditions, such as inflation changes or cost increases (or decreases) for specific commodities.

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Comparison of Different types of Contracts

Type	Known Scope	Share of Risk	Incentive for Meeting Milestones	Predictability of Cost
Fixed Total Cost	Very High	All Contractor	Low	Very High
Fixed Unit Price	High	Mostly Project	Low	High
Fixed price with Incentive Fee	High	Mostly Project	High	Medium-high
Fixed Fee with Price Adjustment	High	Mostly Project	Low	Medium

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Example: Find the final price

Target Cost = \$200,000 Target Profit = \$40,000
Target Price= \$240,000 Ceiling Price = \$270,000
Share Ratio (Buyer/Seller) = 70/30

If Actual Cost = \$210,000,
Overrun = \$210,000 – \$200,000 = \$10,000
Seller's share of overrun (penalty) = 30% × \$10,000 = \$3,000
Adjusted Profit = \$40,000 – \$3,000 = \$37,000
Final Price = Actual Cost + Adjusted Profit = \$210,000 + \$37,000 = \$247,000

The buyer pays \$247,000 to the seller. The seller's profit dropped from \$40,000 to \$37,000 due to the overrun.

What would be the final price if Actual Cost is \$190,000?

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Activity 2

A fixed-price-plus-incentive-fee (FPI) contract has a target cost of $7,000,000, a target profit of $650,000, a ceiling price of $7,500,000, and a share ratio of 70/30. The actual cost of the project was $6,000,000. Calculate the final fee and the final price.

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Activity 2

A fixed-price-plus-incentive-fee (FPI) contract has a target cost of $7,000,000, a target profit of $650,000, a ceiling price of $7,500,000, and a share ratio of 70/30. The actual cost of the project was $7,200,000. Calculate the final fee and the final price.

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Cost-reimbursable contracts

This category of contract involves payments (cost reimbursements) to the seller for all legitimate actual costs incurred for completed work, plus a fee representing seller profit.

This type should be used if the scope of work is expected to change significantly during the execution of the contract.

Types of contracts can include:

1. *Cost plus fixed fee (CPFF)*
2. *Cost plus incentive fee (CPIF)*
3. *Cost plus award fee (CPAF)*

Cost Plus Fixed Fee *(CPFF)*

- The seller is reimbursed for all allowable costs for performing the contract work and receives a fixed-fee payment calculated as a percentage of the initial estimated project costs.
- Fee amounts do not change unless the project scope changes.

Cost Plus Incentive Fee (CPIF)

- The seller is reimbursed for all allowable costs for performing the contract work and receives a predetermined incentive fee based on achieving certain performance objectives as outlined in the contract.
- If the final costs are less or greater than the original estimated costs, then both the buyer and seller share costs from the departures based upon a pre-negotiated cost-sharing formula/ratio (e.g. 80/20 : 80 for buyer and 20 for seller).
- Final Incentive Fee = ((Target cost – Actual Cost) * Seller's sharing ratio) + Target fee

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Activity 3

A cost-plus-incentive-fee contract has the following characteristics:

- Sharing ratio: 80/20
- Target cost: $100,000
- Target fee: $12,000
- Maximum fee: $15,000
- Minimum fee: $10,000

How much will the seller be reimbursed if the cost of performing the work is $80,000?

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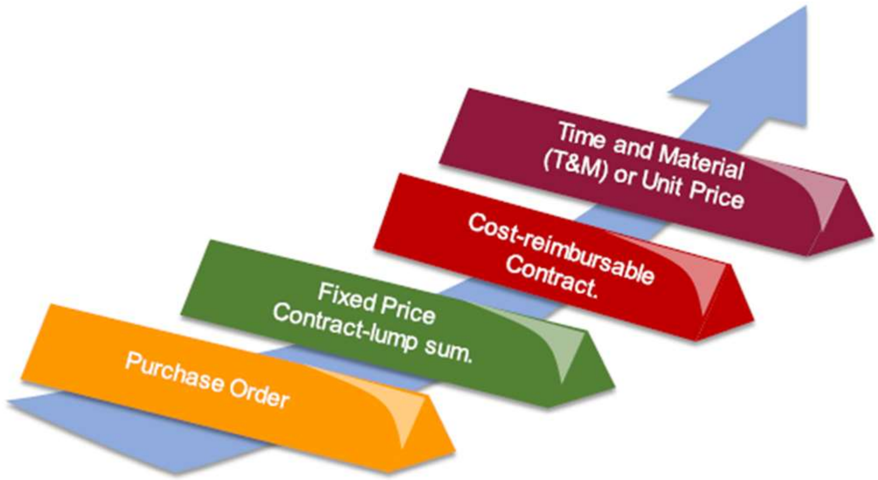
Cost Plus Award Fee (CPAF)

- The seller is reimbursed for all legitimate costs, but the majority of the fee is earned based on the satisfaction of certain broad subjective performance criteria that are defined and incorporated into the contract.
- The determination of fee is based solely on the subjective determination of seller performance by the buyer and is generally not subject to appeals.

Time and material contracts (T&M).

- Also called time and means contracts
- A hybrid type of contractual arrangement with aspects of both cost-reimbursable and fixed-price contracts.
- Often used for;
    - staff augmentation (hire staff for the project),
    - acquisition of experts and any outside support
    - when a precise statement of work cannot be quickly prescribed.
- Example: $1k per day plus expenses or material cost.

Legal Contractual Relationships



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Risks Associated with Contracts

Fixed Price (FP)	**Time & Material**	**Cost Reimbursable**
FFP	For small projects	CPFF
FP-EPA		CPPC
FPIF		CPAF

LOW ⟵ **BUYER'S RISK** ⟶ HIGH

HIGH ⟵ **SELLER'S RISK** ⟶ LOW

✓ **Unclear requirements and SOW are a risk and have cost and schedule impacts**.

https://humanassetrm.wordpress.com/2014/05/24/procurements-and-ri

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QUIZ

If the software developing company (contractor) can get all their expenses related to the contract work reimbursed and receive a predetermined incentive fee as outlined in the contract, what type of contract is it?

(a) Cost Plus Award Fee (CPAF)

(b) Cost Plus Incentive Fee (CPIF)

(c) Fixed Price Incentive Fee (FPIF)

(d) Fixed Price with Economic Price Adjustments (FPEPA)

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Source/Seller Selection Process

1. Planning
   - Establish evaluation criteria
   - Submit to source selection authority
2. Forming the Evaluation Team
   - Teaming approach
   - Team members selected
   - Select supporting contractor personnel
   - Briefing team members & information sharing
   - Convening panel
3. Conducting the Evaluation
   - Tailored to the analysis

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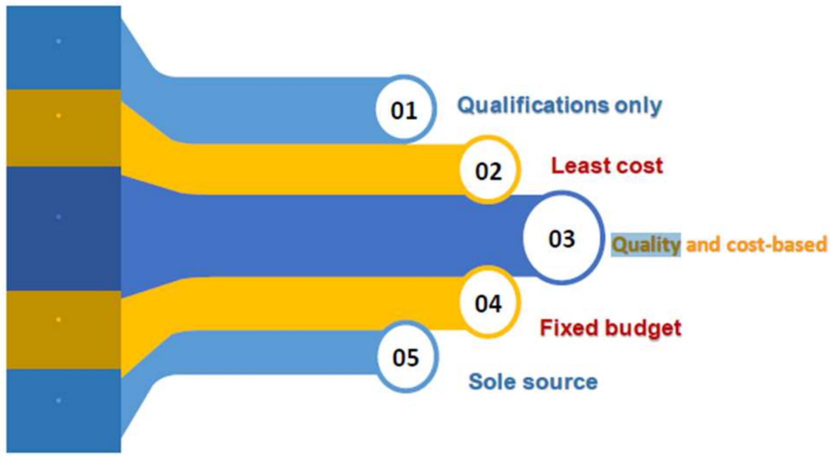
PLAN PROCUREMENT MANAGEMENT: TOOLS AND TECHNIQUES>

Source Selection Analysis Methods



Source Selection Analysis

1. Least cost

Appropriate for procurements of a standard or routine nature where well-established practices and standards exist and a specific and well-defined outcome is expected, and which can be executed at different costs.

2. Qualifications only

This applies when the procurement value is relatively small, and the time and cost of a full selection process would not make sense. The buyer establishes a short list and selects the bidder with the best credibility, qualifications, experience, expertise, areas of specialization, and references.

Source Selection Analysis contd.

3. Quality-based/highest technical proposal score

The selected firm is asked to submit a proposal with both technical and cost details and is then invited to negotiate the contract if the technical proposal proves acceptable.

- Using this method, technical proposals are first evaluated based on the quality of the technical solution offered.
- The seller who submitted the highest-ranked technical proposal is selected if their financial proposal can be negotiated and accepted.

4. Quality and cost-based

The quality and cost-based method allows cost to be included as a factor in the seller selection process.

When risk and/or uncertainty are greater for the project, quality should be a key element when compared to cost.

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Source Selection Analysis contd.

5. Sole source

- The buyer asks a specific seller to prepare technical and financial proposals, which are then negotiated. Since there is no competition, this method is acceptable only when properly justified and should be viewed as an exception.

6. Fixed budget

- Appropriate only when the SOW (Statement of Work) is precisely defined, no changes are anticipated, and the budget is fixed and cannot be exceeded.
- Sellers can adapt the scope and quality of their offer to the given budget. The buyer should ensure that the budget is compatible with the SOW (Statement of Work) and that the seller will be able to perform the tasks within the budget.

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QUIZ

- Which source selection method allows you to select the seller who submitted the highest-ranked technical proposal if their financial proposal can be negotiated and accepted?

a) Least cost
b) Qualifications only
c) Quality-based/highest technical proposal score
d) Quality and cost-based
e) Fixed budget
f) Sole source

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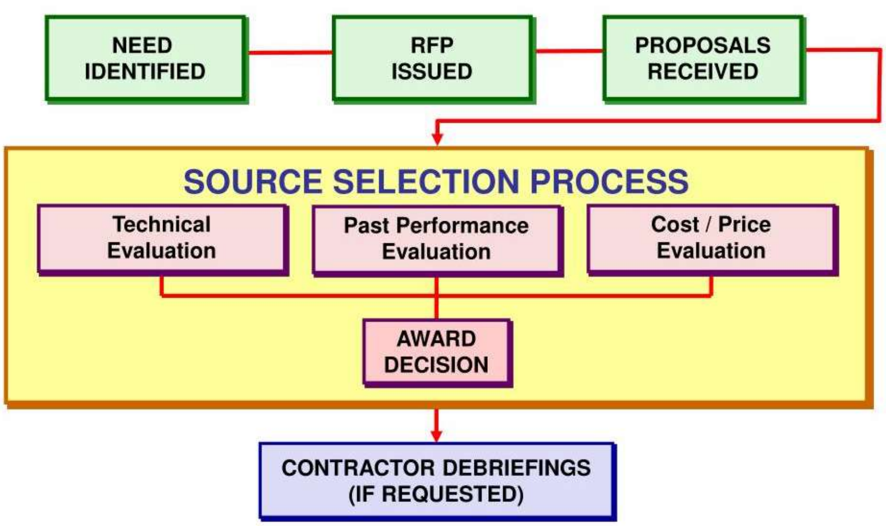
Source Selection Process



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Conduct Procurements

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Scope management plan • Requirements management plan • Communications management plan • Risk management plan • Procurement management plan • Configuration management plan • Cost baseline .2 Project documents • Lessons learned register • Project schedule • Requirements documentation • Risk register • Stakeholder register .3 Procurement documentation .4 Seller proposals .5 Enterprise environmental factors .6 Organizational process assets	.1 Expert judgment .2 Advertising .3 Bidder conferences .4 Data analysis • Proposal evaluation .5 Interpersonal and team skills • Negotiation	.1 Selected sellers .2 Agreements .3 Change requests .4 Project management plan updates • Requirements management plan • Quality management plan • Communications management plan • Risk management plan • Procurement management plan • Scope baseline • Schedule baseline • Cost baseline .5 Project documents updates • Lessons learned register • Requirements documentation • Requirements traceability matrix • Resource calendars • Risk register • Stakeholder register .6 Organizational process assets updates

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Control Procurements

Inputs	Tools & Techniques	Outputs
.1 Project management plan • Requirements management plan • Risk management plan • Procurement management plan • Change management plan • Schedule baseline .2 Project documents • Assumption log • Lessons learned register • Milestone list • Quality reports • Requirements documentation • Requirements traceability matrix • Risk register • Stakeholder register .3 Agreements .4 Procurement documentation .5 Approved change requests .6 Work performance data .7 Enterprise environmental factors .8 Organizational process assets	.1 Expert judgment .2 Claims administration .3 Data analysis • Performance reviews • Earned value analysis • Trend analysis .4 Inspection .5 Audits	.1 Closed procurements .2 Work performance information .3 Procurement documentation updates .4 Change requests .5 Project management plan updates • Risk management plan • Procurement management plan • Schedule baseline • Cost baseline .6 Project documents updates • Lessons learned register • Resource requirements • Requirements traceability matrix • Risk register • Stakeholder register .7 Organizational process assets updates

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Data Analysis

Performance Reviews

- Performance reviews for contracts measure, compare and analyze quality, resource schedule, and cost performance against the agreement.
- This includes identifying work packages that are ahead or behind schedule, over or under budget, or have resource or quality issues.

Earned Value Analysis (EVA)

- Schedule and cost variances, along with schedule and cost performance indexes, are calculated to determine the degree of variance from the target.

Trend Analysis

- To forecast estimate at completion (EAC) for cost performance to see if performance is improving or deteriorating.

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Q&A

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