Project Management: Planning, Execution, Evaluation and Control

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Welcome to the course Project Management Planning, Execution, Evaluation and Control. I am Professor Sanjeev Choudhury from Indian Institute of Technology Kharagpur. Today we will start a new module, module 12, that deals with contract management and related issues. In this lecture, we will be discussing the various types of contracts and their salient features. To start with, the concepts that will be covered in this lecture are procurement management process, contract and its salient features. Then the different types of contracts like fixed price contract or lump sum agreement, cost plus contract, and the risk associated with different types of contracts.

Then we will discuss computing contract cost and price, and contract change management control systems. These are the topics we will be covering during this lecture. Now, procurement management process, as we all know, contract management is a key element of the procurement management process. And procurement management basically has 6 steps. The 6 main steps are: first two are planning, purchases and acquisition. What is that? It generally determines what to procure, when to procure and how to procure. These are the main things it deals with. This is also a classic build versus buy analysis, which is also done at this stage. It also determines what type of contracts are beneficial to use.

There are different types of contracts. So, these are the essence of planning, purchases and acquisition. The next step is planning contracting. Here, what do you do? It describes your project's contracting types and the outcome is shown through documents in the RFP, that is, request for proposal. It also talks about the selection criteria.

There must be firm selection criteria. Then it is requesting sellers' responses. In the next step, you try to obtain the sellers' quotations, information, bids, proposals. Based on this, you prepare a sellers list, that is, those sellers who are qualified and meet your requirements, both technical and financial. Then selecting a seller based on your criteria. You develop your criteria and evaluate and select the sellers who meet those criteria.

Then administering the contract, that is, you establish relationships with the vendor suppliers and administer the contract for its logical course of action.

Then closing the contract. These are the 6 main steps of the procurement management process. It is a big subject and our discussion will not cover its full scope, but we will concentrate on a key element of the procurement management process, which is contract management, its various types, the risks associated with it, and all the related issues.

So, to start with, what is a contract? How do you define a contract? All of us have certain perceptions about contracts. A contract is a formal agreement between 2 parties wherein 1 party obligates itself to perform a service or work for the other party, and the other party in return tries to do something, usually in the form of a payment. So, a contract is not only a formal agreement, it is more than that. It is the codification of private laws and governs the relationship for doing the work during the contract period.

You can say that the salient features of a contract are that it defines the responsibilities of both parties, spells out the rights of both parties regarding what they should and should not do, specifies the conditions of operations that govern the relationship, and grants remedies to a party if the other party breaches its transactional obligations. So, we can say that a contract is a formal agreement between 2 parties wherein 1 party, say the contractor, agrees to perform certain services or work for the other party, the client, and the client tries to give something in return, usually payment, in financial terms. The contract also specifies the responsibilities and rights of both parties, the conditions of operations that will govern their relationship, and grants remedies if one party breaches its obligations.

There are usually 2 main types of contracts and others are variations of them. One is called a fixed price contract or lump sum agreement. In this type of contract, the contractor, usually the lowest bidder, tries to do all the work specified in the contract at a fixed price. This price will not change during the course of the contract; it can only change if the scope of work changes.

So, this is a fixed contract. We will be discussing the salient features of fixed contracts, their applicability, risks involved, advantages and disadvantages. As I told you, in a fixed price contract, the contractor agrees to perform a work or service specified in the contract at a fixed price, unless the scope is changed. Clients get the minimum price through competitive bidding, that is, the L1 or lowest bid generally gets the contract. Contractors usually get to know about the work through advertisements, invitation for bids in newspapers, trade journals, company websites. In large organizations, they enlist bidders.

Potential bidders can enlist their company in the bidders list of that company, which has certain criteria. Every company has different criteria for enlisting bidders. Owners or clients can put restrictions on potential bidders because there may be many non-serious bidders who undercut or underprice the budget, disrupting the selection process. To resist that, clients can put restrictions in terms of technical requirements, financial requirements, company size or ISO certifications.

A fixed price contract is preferred by both contractors and clients when the scope is well-defined, costs are predictable, and implementation risk is minimum. Contractors prefer fixed price contracts as the client is less likely to change or request additions, and clients are satisfied because they do not have to go into the nitty-gritty details repeatedly.

However, there are disadvantages for the owner in fixed price contracts. It is difficult and costly to prepare and estimate the exact fixed price. It requires sufficient design details, which is costly and time-consuming. Owners' estimations may be over or under, which is a disadvantage. But the disadvantages for contractors are far more serious. They have to accurately estimate the cost, otherwise they face the risk of under or over-estimating. If they underestimate, they may win the contract but face high costs and low profitability. If there are unforeseen delays or obstacles, the project may get delayed and the company may even go bankrupt. If they overestimate, they may not win the contract. So, contractors have to be very careful with fixed price contracts.

Fixed price contracts have low risk for customers but very high risk for sellers. We will discuss other types of contracts and their risk profiles later.

Now, let's discuss contract adjustment. Contracts may require some adjustment. Contract adjustments are done through redetermination provisions and performance incentives. Any contract should have these adjustment clauses.

For long-duration projects, the price of materials, labor rates, overhead costs may go up. This disadvantages the contractor. So, there should be some price escalation provisions to protect the contractor. Usually, some formula is inserted in the contract that links prices with the inflation rate. Another adjustment is the redetermination contract. This is appropriate when the engineering design estimates are not known and still evolving, and cost data is not sufficiently accurate. In such cases, you have to redetermine the contract. However, this type of contract is more prone to abuse by the contractor. They may take advantage of the client's ignorance and try to inflate bills to cover up earlier losses if they underbid. To recoup losses, they resort to the redetermination clause and exploit the client's ignorance. But clients, if they get wind of it, may delay approvals at different stages, causing the contract to get delayed and the contractor to incur extra costs. These aspects should be looked into and there must be fair dealings from both sides. Contractors also have a tendency to use cheaper materials to reduce costs. To prevent this, specifications should be very specific so contractors get the message to use specified quality materials. To oversee this, clients generally engage experts or professionals in that field to ensure fair practices and maintain the quality of materials. Another adjustment clause is performance incentives. To keep the contractor in check, it is better to introduce incentive clauses in the contract to reduce cost and improve efficiency. Here, you introduce the concept of cost sharing ratio. You make an incentive plan by fixing a target cost of the project and the maximum profit the contractor can have.

If the contractor completes the project below the target cost, they should get a bonus up to the maximum profit that has been fixed. This clause incentivizes the contractor to finish the project below the target cost and ahead of schedule to earn a bonus. The concept of cost sharing ratio is that if the cost goes beyond the target, the contractor must bear a part of it, usually 25% while the client bears 75%. This penalizes the contractor and incentivizes them to complete the contract within the target cost. Another type of contract is cost plus contract. We will discuss its salient features, applicability, risks, advantages and disadvantages. In a cost plus contract, the contractor is reimbursed the allowable direct costs incurred, like labor, material, travel and other project costs, plus they are paid a pre-negotiated fee, usually expressed as a percentage of the total cost, say 8-10%, to cover overhead and provide some profit.

The risk for the client is high as they are relying on the contractor to contain costs. The contractor's motivation to reduce cost is low since they get reimbursed for total costs plus a fee. Their only motivation is to maintain reputation and win future contracts, which they may lose if costs go excessively high. In a cost plus contract, the buyer's risk is very high but the seller's risk is very low, opposite to a fixed price contract. There can be many variations between fixed price and cost plus contracts, like fixed price with incentives based on cost targets. In a cost plus contract, the client must have controls on the contractor through performance and schedule incentives and cost sharing clauses incorporated in the contract.

Performance incentives are similar to fixed price contracts, but instead of cost targets, incentives are based on actual costs. You can set cost ranges - if the contractor completes the project in a lower range, they get higher incentives, and vice versa. Schedule incentive means setting a due date, and if the project is completed before that, the contractor gets a bonus, effectively reducing the contract cost. Cost sharing clauses, as discussed for fixed price contracts, should also be there in cost plus contracts.

We have discussed the contract type versus risk profile. There can be many variations between fixed price and cost plus contracts. To compute contract cost and price, as discussed in a previous module, you take the direct cost, overhead cost which gives the total direct cost, add general and administrative overhead to get the total cost, and apply the profit margin to arrive at the total bid price.

Now let's discuss the contract change control system. In contracts, especially large, long-duration ones, changes are common, especially changes in scope of work or service. You have to define the process by which the contract's authorized scope can be modified. A contract is a formal legal agreement between two parties. Changing a legal document cannot be done casually; it has to follow a laid down procedure and be approved by the appropriate authority to be incorporated into the contract. The process requires paperwork, tracking systems, dispute resolution procedures because conflicts are bound to happen in large contracts, and approval levels necessary for authorizing changes. Best practice is to include the contract change control system provision in the original contract itself. Any good contract must have this provision and it must be followed. These are the key aspects of contract changes.

There can be many reasons for changes in a contract. For instance, the client may require a change in design or project scope. Suppose you are constructing a building and the client thinks there should be more windows on one side, so you have to change the contract scope. Market changes are another reason - markets are not always steady and may dictate adding new features or enhancing performance requirements, which may necessitate scope changes. Fund crunch or resource crunch, where the budget is not approved or resources like people, equipment, materials are unavailable, may lead to reducing the scope of work. Unforeseen legitimate problems for the contractor, like material prices going up or specified material not being available requiring substitution, or excessive groundwater during construction, may require contract changes. External factors like changes in regulations or safety standards that incur more cost may also cause difficulties for the contractor and lead to contract changes. Effective changes in a contract need a formally agreed upon procedure to incorporate the change. A contract change order is subject to abuse. If the client is ignorant, the contractor may take advantage and abuse the contract. This has to be prevented.

Contract management, in perspective, is not an exact science. It involves more judgment, administration and many other things. Trying to regulate a contract through clauses is an ongoing process - plugging some loopholes through a new clause may lead to other loopholes coming up, just like removing a wrinkle from one part of a rug may cause another wrinkle to form elsewhere. It is not an exact science, which must be kept in mind. To summarize, contract management is a key element of the project procurement management system.

A contract is a formal agreement between two parties wherein the contractor obligates itself to perform a service and the client obligates itself to do something in return, usually payment. There are different types of contracts such as fixed price or lump sum agreement, cost plus contract, and variations thereof. We explained different contract types versus risk - buyer's risk and seller's risk, advantages, disadvantages and characteristics of different contract types, applications of contract cost and price, contract change control systems, etc. We also mentioned the procurement management process that includes planning of purchases and acquisition, planning contracting, requesting sellers' responses, selecting sellers, administering the contract and closing the contract.

These are some reference books you may go through to enrich yourself further. Thank you very much for attending this lecture.