

Managing Contracts

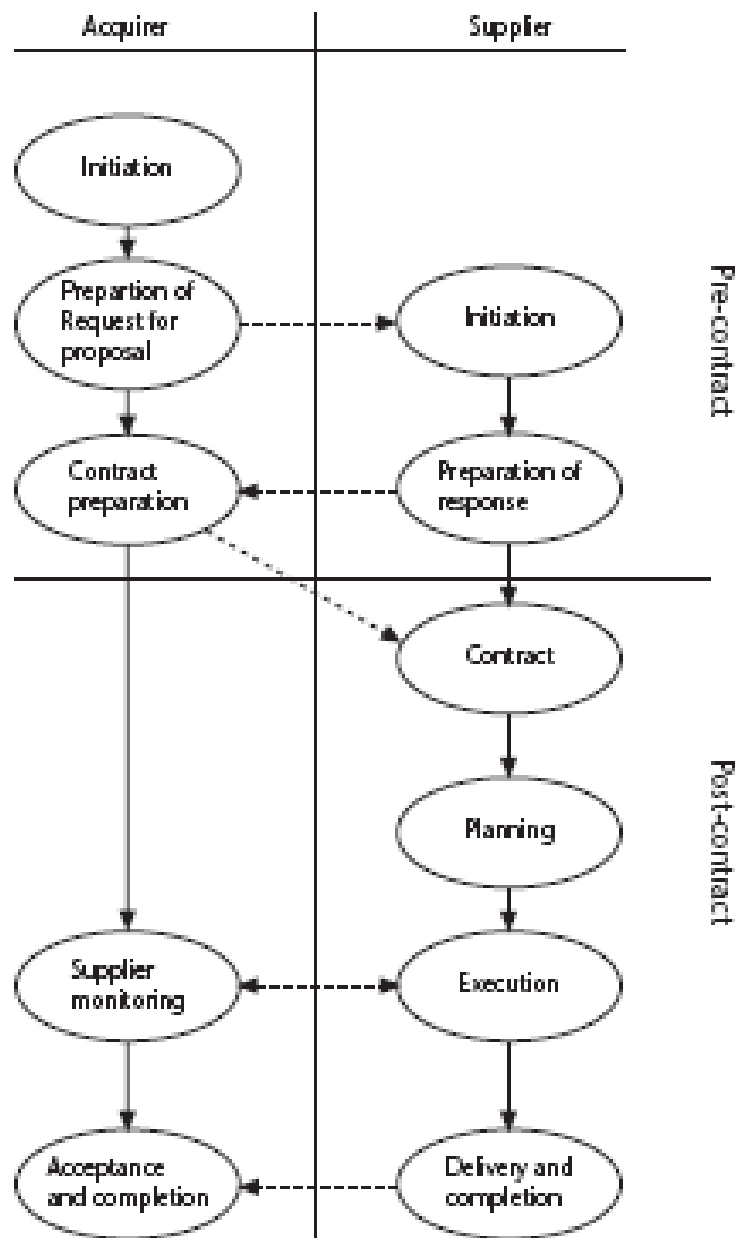
Types of contract

Acquiring software from external supplier

This could be done via:

- a bespoke system - created specifically for the customer;
- off-the-shelf - bought ‘as is’ – this is sometimes referred to as shrink-wrapped software;
- customized off-the-shelf (COTS) - a core system is customized to meet needs of a particular customer.

ISO 12207 acquisition and supply process



Part of the ISO 12207 standard relates to the process by which software can be acquired from an external supplier. As can be seen from the diagram, there are two parallel and complementary processes. The acquirer (who wants the software) has a set of processes to carry out which interact with the processes for which the supplier would be responsible.

Types of contract

1. Fixed price contracts
2. Time and materials contracts
3. Fixed price per delivered unit contracts

Note the difference between goods and services.

Often license to use software is bought rather than the software itself

Fixed price contracts

In this situation a price is fixed when the contract is signed. The customer knows that, if there are no changes in the contract terms, this is the price they pay on completion. Even though the supplier will have to add a margin to the price to deal with contingencies, the cost could still be less than doing the work in-house as the supplier may be able to exploit economies of scale and the expertise that they have from having done similar projects in the past.

Advantages to customer:

- known expenditure
- supplier motivated to be cost-effective

Disadvantages:

- supplier will increase price to meet contingencies
- difficult to modify requirements
- upward pressure on the cost of changes
- threat to system quality

Time and materials contracts

The customer is charged at a fixed rate per unit of effort, for example per staff-hour. Because suppliers appear to be given a blank cheque, this approach does not normally find favour with customers. However, the employment of contract developers may involve this type of contract.

Advantages to customer:

- easy to change requirements
- lack of price pressure can assist product quality

Disadvantages:

- Customer liability - the customer absorbs all the risk associated with poorly defined or changing requirements
- Lack of incentive for supplier to be cost-effective

Fixed price per delivered unit contracts

Fixed price per delivered unit contract is often associated with function point (FP) counting. The size of the system to be delivered is calculated or estimated at the outset of the project. The size could be estimated in lines of code, but FPs can be more easily derived from requirements documents. A price per unit is also quoted. The final price is the unit price multiplied by the number of units.

<i>FP count</i>	<i>Design cost/FP</i>	<i>implementation cost/FP</i>	<i>total cost/FP</i>
Up to 2,000	\$242	\$725	\$967
2,001- 2,500	\$255	\$764	\$1,019
2,501-3,000	\$265	\$793	\$1,058
3,001-3,500	\$274	\$820	\$1,094
3,501-4,000	\$284	\$850	\$1,134

These figures do come from a real source (RDI Technologies in the USA). These are now several year old. The bigger the project, the higher the cost per function point. Recall that function points were covered in Lecture/Chapter 5 on software effort estimation.

Example

- Estimated system size 2,600 FPs
- Price
 - 2000 FPs x \$967 plus
 - 500 FPs x \$1,019 plus

– 100 FPs x \$1,058

– i.e. \$2,549,300

- What would be charge for 3,200 FPs?

2000 FPs at \$967 = \$1,934,000

500 FPs at \$1019 = \$509,500

500 FPs at \$1058 = \$529,000

200 FPs at \$1094= \$218,800

total \$3,191,300

Advantages for customer

- customer understanding of how price is calculated
- comparability between different pricing schedules
- emerging functionality can be accounted for
- supplier incentive to be cost-effective

Disadvantages

- difficulties with software size measurement - may need independentFP counter
- Changing (as opposed to new) requirements: how do you charge?

Stages in Contract Placement

The tendering process

- Open tendering
 - any supplier can bid in response to the *invitation to tender*
 - all tenders must be evaluated in the same way
 - government bodies may have to do this by local/international law
- Restricted tendering process
 - bids only from those specifically invited
 - can reduce suppliers being considered at any stage
- Negotiated procedure
 - negotiate with one supplier e.g. for extensions to software already supplied

Stages in contract placement

Requirements Analysis

The very first step in software development process is requirement analysis. The requirements are gathered from user/customers by user management team and managers and specified in requirement document.

Main sections in a requirement document

1. introduction
2. description of existing system and current environment
3. future strategy or plans
4. system requirements
 - mandatory
 - desirable features
5. Deadlines
 - functions in software, with necessary inputs and outputs
 - standards to be adhered to
 - other applications with which software is to be compatible
 - quality requirements e.g. response times
6. additional information required from bidders

The requirements document is sometimes referred to as the operational requirement or OR. If a mandatory requirement cannot be met the proposed application would have to be rejected regardless of how good it might be in other ways. A shortfall in one desirable requirement might be compensated for by other qualities or features.

Evaluation plan

- How are proposals to be evaluated?
- Methods could include:
 - reading proposals
 - interviews
 - demonstrations
 - site visits
 - practical tests
- Off the shelf software clearly has an advantage here as there is actually product that can be evaluated in existence.

- Need to assess value for money for each desirable feature
- Example:
 - feeder file saves data input
 - 4 hours a month saved
 - cost of data entry at RM20 an hour
 - system to be used for 4 years
 - if cost of feature RM1000, would it be worth it?

RM(4 x 20 x 12 x 4) would be saved i.e. RM3,840. The payback period would be just over a year and so this feature would be worth the additional cost.

Invitation to tender (ITT)

- Note that bidder is making an *offer* in response to ITT
- *acceptance* of offer creates a *contract*
- Customer may need further information
- Problem of different technical solutions to the same problem
- ISO 12207 refers to an ITT as a Request for Proposal or RFP.

Memoranda of agreement (MoA)

- Customer asks for technical proposals
- Technical proposals are examined and discussed
- Agreed technical solution in MoA
- Tenders are then requested from suppliers based in MoA
- Tenders judged on price
- Fee could be paid for technical proposals by customer

Evaluation of proposals

- **Usability of existing package**
Could try out a demo or ask existing users
- **Usability of application to be built**
You would have to make stipulation about the process e.g. on the development of interface prototypes; you could also specify performance requirements
- **Maintenance costs of hardware**
this could be incorporated in a maintenance agreement and you could compare the terms offered by different potential suppliers; another approach is ask to current users of the

hardware about their experience of it.

- **Time taken to respond to support requests**

this could once again be made a contractual matter and the terms offered by different suppliers could be compared; suppliers could be asked to supply evidence of their past performance (but they might refuse, or not tell the truth); you could ask for references from current customers of the supplier;

- **Training**

once again references could be taken up; you could ask for the CV of the trainer; you could even get them to give a short presentation

Typical Terms Of A Contract

Some of the major areas of contract document are as follows:

- ❖ Definitions
- ❖ Form of agreement
- ❖ Goods and services to be supplied
- ❖ Ownership of the software
- ❖ Environment
- ❖ Customer commitment
- ❖ Acceptance procedures
- ❖ Standards
- ❖ Project and quality management
- ❖ Timetable
- ❖ Price and payment method
- ❖ Miscellaneous legal requirements

Definitions

The terminology use in the contract document may need to be defined, e.g. who is meant by the words 'client' and 'supplier'.

Form of agreement

For example, is it a contract of sale, a lease, or a licence?

Goods and services to be supplied

Equipment and software to be supplied – this should include an actual list of the individual pieces of equipment to be delivered, complete with specific model numbers.

Services to be provided

- Training;
- Documentation;
- Installation;
- Conversion of existing files;
- Maintenance agreements;
- Transitional insurance arrangements.

Ownership of the software

Who has Ownership of the software? There may be two key issues here.

1. Whether the customer can sell the software to others
2. Whether the supplier can sell the software to others.

Where an off-the-shelf package is concerned, the supplier often simply grants a licence for the customer to use the software. An *escrow* agreement can be included in the contract so the up-to-date copies of the source code are deposited with a third party. In the UK, the NCC Group provides an escrow service.

Environment

- Where physical equipment is to be installed, the demarcation line between the supplier's and customer's responsibilities with regard to such matters as accommodation and electrical supply needs to be specified.
- Where software is being supplied, the compatibility of the software with existing hardware and operating system platforms would need to be confirmed.

Customer commitment

Even when work is carried out by external contracts, a development project still needs the participation of the customer. The customer may have to provide accommodation for the suppliers and perhaps other facilities such as telephone lines.

Acceptance procedures

Good practice is to accept a delivered system only after user acceptance tests. Part of the contract would specify such details as the time that the customer will have to conduct the tests, deliverables upon which the acceptance tests depend and the procedure for signing off the testing as completed.

Standards

It covers the standard with which the goods and services should comply. For example, a customer could require the supplier to conform to the ISO 12207 standard relating to the software life cycle and its documentation.

Project and quality management

The arrangements for the management of the project must be agreed. These include the frequency and nature of progress meetings and the progress information to be supplied to the customer. The contract could require that appropriate ISO 9001 standards are followed.

Timetable

This provides a schedule of when the key parts of the project should be completed. The timetable will commit both the supplier and the customer.

Price and payment method

Obviously the price is very important. What also needs to be agreed is when the payments are to be made. The supplier's desire to be able to meet costs as they are incurred needs to be balanced by the customer's requirement to ensure that goods and services are satisfactory before parting with their money.

Miscellaneous legal requirements

This is legal small print. A contract may require clauses which deals with such matters as the definition of terms used in the contract, the legal jurisdiction that will apply to the contract, what conditions would apply to the subcontracting of the work, liability for damage to third parties, and liquidated damages.

Contract management

Contracts should include agreement about how customer/supplier relationship is to be managed e.g.

- decision points - could be linked to payment
- quality reviews
- changes to requirements

Acceptance

- When work is completed, customer needs to carry out acceptance testing.
- Contract may put a time limit to acceptance testing – customer must perform testing before time expired.
- Part or all payment to the supplier should depend on acceptance testing