

Questionnaire: The anticipated impact that different contract strategies have on a project's cost and time performance

An example project is outlined below. Imagine that you are the adviser to the client of this project. You have undertaken a feasibility study for the project and developed a brief. Therefore you have a descriptive outline of the design and are able to develop a basic cost and time plan.

Project Specification:

The project is a large factory building with offices. The overall project cost is estimated at £15 million and project duration at 5 years. The building shall occupy approximately 20,000 square metres. The building requires an original design because it is a one-off project.

The building shall house some specialised equipment. The building's structure will be complex and shall comprise different structures. It is unlikely that the construction process will need to employ any new technology. The building's steel frame shall be prefabricated locally and transported to the site for erection.

The site is currently occupied by disused warehouses. Therefore the construction contract includes the demolition of these buildings and clearing of the site. The soil is relatively strong and ground problems are unlikely.

The site is located on the outskirts of a city centre. The adjacent buildings could impose some construction restrictions. Physical access onto the site is easy, but traffic congestion on the surrounding road infrastructure is not uncommon.

Assume that you have 4 contract strategy options:

- **Traditional:** The client appoints an organisation to undertake the design. The design is completed before obtaining tenders by means of a **competitive one-stage** process. A **full bill of quantities** will be the basis of the tender, although the firm price agreed at the tender stage will be subject to **re-measurement**. The appointed contractor is to be an independent organisation from that of the client and designer.
- **Accelerated Traditional:** As with the Traditional option, the client appoints an organisation to undertake the design and the appointed contractor is to be an independent organisation from that of the client and designer. The construction contractor is appointed, before design completion, following a **negotiated** tender which is based upon **outline drawings and a detailed project specification**. The contractor is to be reimbursed for the actual construction costs and also receives a fixed fee agreed at the tender stage (i.e. **cost plus fixed fee** type pricing mechanism).
- **Management Contracting:** The client appoints an organisation to undertake the design. During the early design stages, another organisation is appointed to act as a management contractor. This appointment follows a **pre-qualification process and negotiation of a management fee** which is quoted as a **percentage of the construction cost**. The construction work is divided into five packages. Tenders are obtained for each work package by means of **single-stage selective** tendering. Tenders are based upon **drawings and approximate quantities**. The works contractors are to be reimbursed using **cost plus percentage fee** type pricing mechanisms.
- **Design-Build:** The entire design and construction work is let to a single organisation following a **two-stage tender** process. First stage tenders, based upon a **detailed project specification**, lead to a shortlist of, no more than, two contractors. At the second stage the contractor is selected on the basis of the **design proposals and a fixed lump sum price**.

SECTION 1 SEPARATED DESIGN AND CONSTRUCTION

Definitions:

- **design cost** refers to the cost that the client pays for all design related activities.
- **design time** refers to the time period between commencement of the conceptual design and the completion of the production information.
- **construction cost** refers to the cost that the client pays for all construction related activities
- **construction time** is used here to describe the time period between commencement and completion of construction.

Initially it has been assumed that the project is to be procured using the **Traditional** arrangement. The project's cost and time performance has been evaluated based upon this assumption. The result of the evaluation are estimates of the following cost and time elements:

1. Design cost
2. Design duration
3. Construction cost
4. Construction time

Each cost and time element is estimated in terms of a minimum, most likely and maximum value (see Column 1 in the table below). The estimates in Column 2 of the table are those based upon the assumption that the project is procured using the **Traditional** arrangement.

Q1. a) By making any relevant assumptions can you estimate new minimum, most likely and maximum values for each of the cost and time elements assuming that the project is to be procured using, instead:

1. the **Accelerated Traditional** arrangement (input estimates in Column 3)?
2. the **Management Contracting** arrangement (input estimates in Column 4)?

Column 1	Column 2	Column 3	Column 4
cost/time element	Traditional	Accelerated Traditional	Management Contracting
Minimum design cost	£1.15m		
Most likely design cost	£1.3m		
Maximum design cost	£1.4m		
Minimum design time	1.4 yrs		
Most likely design time	1.5 yrs		
Maximum design time	1.7 yrs		
Minimum construction cost	£12.5m		
Most likely construction cost	£13.5m		
Maximum construction cost	£15.0m		
Minimum construction time	3.0yrs		
Most likely construction time	3.5yrs		
Maximum construction time	4.2yrs		

Q1. b) Briefly state any assumptions (e.g. about the project specification, the client, the contract strategy options, etc.) that you reflected in your cost and time estimates?

SECTION 2 INTEGRATED DESIGN AND CONSTRUCTION

Column 2 of the table below presents the minimum, most likely and maximum values of:

1. total design and construction cost; and
2. total design and construction time;

based upon the assumption that the project is to be procured using the **Traditional** arrangement.

Q2. a) By making any relevant assumptions can you estimate new minimum, most likely and maximum values for each of the totalled cost and time elements assuming that the project is to be procured using, instead, the **Design-Build** arrangement (input estimates in Column 3)?

Column 1	Column 2	Column 3
Total cost/time element	Traditional	Design-Build
Minimum total cost of the design and construction	£13.1m	
Average total cost of the design and construction	£14.8m	
Maximum total cost of the design and construction	£16.4m	
Minimum total duration of the design and construction	4.4yrs	
Average total duration of the design and construction	5.0yrs	
Maximum total duration of the design and construction	5.9yrs	

Q2. b) Briefly state any assumptions (e.g. about the project specification, the client, the contract strategy options, etc.) that you reflected in your cost and time estimates?

SECTION 3 DESIGN-CONSTRUCTION OVERLAP

The design and construction stages of the project are undertaken sequentially when the project is procured using the **Traditional** arrangement. It is presumed that the design and construction stages overlap when the other 3 contract strategy options are used to procure the project.

Q3. a) Can you estimate, in the table below, the length of time between the start of the project’s design and the start of the construction (i.e. the overlap), for the 3 contract strategy alternatives to the **Traditional** option?

contract strategy	design-construction overlap (weeks)
Accelerated Traditional	
Management Contract	
Design-Build	

Q3. b) Briefly state any assumptions that you reflected in the above estimates?

SECTION 4 TENDER PROCESS COST/DURATION AND TRANSACTION COSTS

Definitions

- **tender costs** refers to all costs to the client related to the preparation of the tender documents, appraisal of tenders, negotiation and contract award.
- **tender duration** refers to the time period between the distribution of the tender documents and the contract award.
- **transaction costs** refers to the client’s administrative costs generated by the contract interfaces between the project participants.

Q4. a) Can you estimate the minimum, most likely and maximum values of the tender process costs, tender process duration and transaction costs for all four contract strategy options? Input your estimates in the corresponding table cells overleaf.

Q4. b) Briefly state any assumptions that you reflected in your estimates?

cost/time element	Traditional	Accelerated Traditional	Design-Build
Minimum tender cost			
Most likely tender cost			
Maximum tender cost			
Minimum tender time			
Most likely tender time			
Maximum tender time			
Minimum transaction costs			
Most likely transaction costs			
Maximum transaction costs			

cost/time element	Management Contracting
Minimum tender cost (management contractor)	
Most likely tender cost (management contractor)	
Maximum tender cost (management contractor)	
Minimum tender cost (works contractors)	
Most likely tender cost (works contractors)	
Maximum tender cost (works contractors)	
Minimum tender time (works contractors)	
Most likely tender time (works contractors)	
Maximum tender time (works contractors)	
Minimum transaction costs	
Most likely transaction costs	
Maximum transaction costs	