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1

The construction industry

Aim

This chapter introduces the concept of the construction professional and explains the nature of construction.

Learning outcomes

On completion of this chapter you will be able to:

- >> Relate the basic nature of the construction industry.
- >> Describe how this has produced the characteristics of the construction industry.

Introduction

Imagine for a moment a world without ‘us’. A world without safe water to drink, sewers, waste and sewage treatment; electricity and gas supplies, telecommunications; roads, railways, airports, canals, docks and harbours; schools, hospitals, offices, shops and factories; houses; art galleries, churches and cathedrals; and you see a world without the construction professional. You see a world without civilisation.

But construction is not a straightforward endeavour. It is very complex, with numerous interconnecting professions and activities requiring skill, knowledge, coordination and expertise. This is the realm of the construction professional who works within the built environment.

This book seeks to describe the activities of the construction professional, the importance of these and their interrelationship. Much of the academic training of civil engineers concentrates on design modules, often mathematical, largely because of their complexity and difficulty. Although students of the building professions have a broader academic training, they still spend a great deal of time learning about design and its application. However, to convert these designs into constructed assets requires a very different skill set based on contracts, management and people – concepts that this book attempts to explain.

Whilst it is possible to study each contractual aspect in isolation, an understanding of their connectivity and mutual dependence is crucial to visualising how construction projects are conceived, designed and constructed. Critically, too, it is the employer (for example, the local council, the supermarket chain, the electricity company) who pays for the construction project. So ensuring that the project truly delivers the requirements of that employer is both a crucial role and a major challenge for the construction professional. This will be explored in detail in this book.

The construction industry

The construction industry covers an enormous range of projects, from those of small value to projects costing billions of pounds; from simple to very complex technology; from projects lasting days to those lasting years. Despite this diversity, all projects have certain common features. Once a construction professional understands these features, he or she can apply them to projects of great variety.

Some characteristics of construction

It is important to understand why construction and the construction industry are different from manufacturing. This understanding can help us appreciate the need for different processes and skills in our industry. Of course there are similarities and there are many initiatives to bring some manufacturing thinking (such as standardisation and prefabrication) into the construction industry, to improve its efficiency. We all buy manufactured products: cars, clothes, televisions, computers, mobile phones, pots, pans and kettles. At first, it is easy to think that the construction industry is the same as manufacturing in that both processes produce a tangible end product. However, construction does in fact have many differences, which construction professionals need to appreciate if they are to be successful in their endeavours:

- The construction industry is characterised by a wide range of contributing professions, each with its own entry standards, ethical standards and professional pride.
- ‘Civil engineering’ and ‘building’ are seen as separate professions in the UK, and their practitioners have different academic training at our universities.
- The industry is ‘trade based’, with a high number of temporary and mobile workers who actually carry out the construction itself, whereas manufacturing tends to have employees who work together from year to year.
- There is an industry shortage of competent labour, and construction and professional personnel.
- Unlike manufacturing, which sells ranges of products to a multitude of customers, construction projects usually have only one *customer* – the employer – but many users and other stakeholders.
- The EU Procurement Directives, applying to all ‘public procurement’, have an enormous effect on tendering and selection, materials specification and employers’ selection processes for suitable suppliers, manufacturers, contractors and consultants, particularly in the civil engineering side of the industry (see Chapter 11).

- Where these directives do not apply, contractors often bid (tender) for projects on a ‘one-off basis’.
- In ‘one-off’ projects teams often come together for the first time. This can make initial communication difficult, so misunderstandings are frequent; whereas in manufacturing teams the working relationships tend to be more permanent.
- Contracting has a low ‘start-up cost’, compared with manufacturing. This can result in new entrants who may be less experienced and competent than established companies and have more potential for insolvency.
- Most construction projects are built ‘outside’, not in a factory environment. Thus ground conditions, weather and access issues produce much of the ‘risk’ inherent in construction.
- Construction projects often require ‘temporary works’, to facilitate the construction of the ‘permanent works’. These temporary works are usually designed by the contractor and are removed before contract completion.
- Many projects have a high individual impact on the environment and the public, and hence there is much legislation that regulates and controls construction activities. By contrast, in manufacturing the appropriate legislation forms part of the initial design of a product, which is then repeated many times during production.
- Construction projects usually require the lease or purchase of land.
- All projects require adequate and safe access. The impact of projects on local road networks must be considered both during construction and when completed.
- Environmental and ecological factors must be considered, both for ethical reasons and to satisfy regulatory bodies (see Chapter 6).
- Sustainability and minimisation of the carbon footprint of our projects is becoming increasingly important and the subject of new legislation.
- Construction is a dangerous activity, and there is a constant need to improve health and safety (see Chapter 7).

The result of these characteristics of construction

These characteristics of construction produce many of the processes and procedures which form an essential part of our industry. It is important for construction professionals to be familiar with them in order to design and build successful projects.

- An appropriate and comprehensive investment process is essential to control projects from concept to completion (see Chapter 2).
- The identification and management of stakeholders is essential (see Chapter 3).
- Thorough site investigation is indispensable (see Chapter 6). This investigation occurs prior to the preparation of the drawings and other documents that form the contract.
- Contract strategies must be selected to match the individual features of projects (see Chapters 8 and 9).
- Acceptable and understood conditions of contract are essential so that the allocation of risk is clear (see Chapters 19 to 25 on NEC3 ECC and Chapter 26 on JCT SBC, two standard forms of contract much used in the construction industry).

- Contract documents must be clear, comprehensive and issued in good time (see Chapter 4).
- Fair and well-structured tendering procedures are necessary, to select appropriate contractors, designers and suppliers in the first place (see Chapter 5).
- Payment mechanisms must be efficient, fair and understood (see Chapter 12).
- Good project management is fundamental if projects are to be run effectively (see Chapter 14).
- Clear, comprehensive and up-to-date design and construction programmes are essential. They need to cover all activities and show their durations, criticality and interrelationship (see Chapter 14).
- Team formation and team working across the whole project are essential to avoid misunderstandings, disputes and unnecessary cost. Team working only happens when the people involved in the project make a clear commitment to it, and constantly strive to improve it (see Chapter 9).
- Health and safety and the Construction (Design and Management) Regulations 2015 are of great importance. Their proper application is a legal requirement on all projects, both domestic and commercial. Chapter 7 deals with these regulations.
- Construction projects usually have an impact on the environment and there is extensive and increasing legislation to improve the activities of construction in this area. Construction professionals should always seek to improve the environment with their projects, and make them as sustainable as possible.

Mechanisms and enablers

Construction professionals are involved in all stages of developing a project, from its first formation to handover to the employer. In fact they drive the project from concept to completion. This process is often called the **investment process** and will be discussed in Chapter 2.

This book will examine many of the important **mechanisms** in this investment process and indirectly refer to many **enablers**. Mechanisms are the processes or systems by which the constructed asset is realised. Enablers are the ‘oil in the wheels’ of the mechanisms. They are attributes, qualities and skills such as respect, trust, good communication, leadership, cooperation and teamwork. Most of the work of the construction professional is concerned with mechanisms, and it is all too easy to concentrate on these and neglect the enablers.

In the previous decade or so, the enablers have become increasingly important in construction. Although not labelled enablers, they were identified in government reports on the industry such as those by Sir Michael Latham (*Constructing the Team*, 1994) and by Sir John Egan (*Rethinking Construction*, 1998). The New Engineering Contract, NEC3 ECC, widely used in Civil Engineering projects, begins with clause 10.1: ‘The employer, the contractor, the project manager and the supervisor shall act as stated in this contract, and in a *spirit of mutual trust and co-operation*.’ So this clause begins with a mechanism and two enablers.

Mechanisms

As outlined above, mechanisms are the processes or systems by which the constructed asset is realised, so they include pricing and payment mechanisms, project plans and programmes, critical path networks, resource scheduling and all

the other tools of project management. Modern procurement has seen the development of many other mechanisms, such as BIM, key performance indicators (KPIs), business process mapping, stakeholder analysis, collaboration tools and benchmarking. The law is largely a mechanism and sets down rules and procedures by which future cases are judged. Similarly, much of this book is devoted to the standard forms of contract used in the industry and how to administer and manage them. An understanding of the mechanisms used in the construction industry is fundamental to success.

Enablers

As described above, enablers are the ‘oil in the wheels’ of the mechanisms – they help the mechanisms work smoothly. Attributes, qualities and skills such as respect, trust, good communication, leadership, cooperation and teamwork are all enablers. By the installation of good mechanisms, and the development of suitable enablers, we produce an effective and efficient investment process. It is possible to argue that many of the problems of the construction industry in previous decades were an over-concentration on mechanisms and the neglect of enablers.

The contract strategy called ‘partnering’ (described in Chapter 9) in various forms is much used today. Partnering concentrates on enablers such as trust, cooperation and continuous improvement, in addition to having a form of contract based on mechanisms. Enablers need to be developed and nurtured, especially if confrontation and diminished relationships are to be avoided if projects start to go wrong. Construction is a complex and difficult process and many projects have problems which need solving. Solutions can be found more easily if good enablers are in place and parties to those contracts can cooperate.

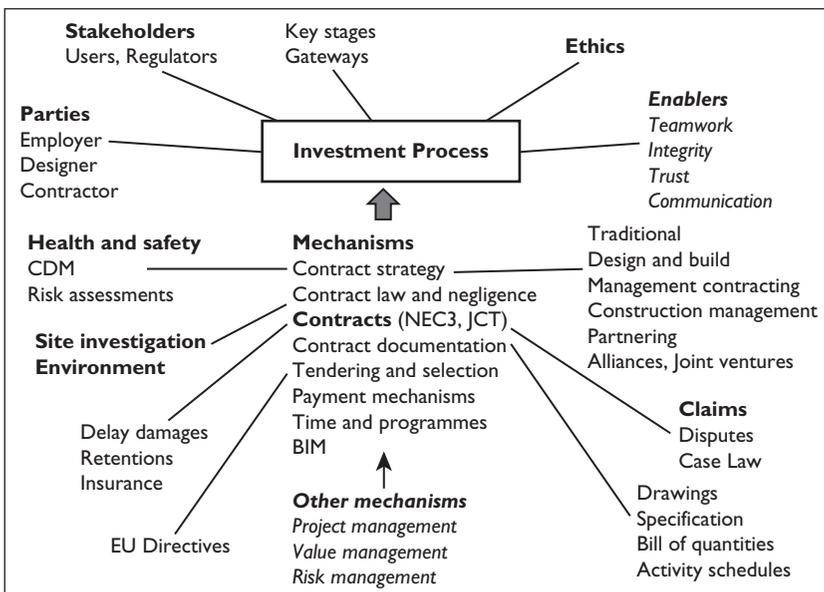


Figure 1.1 The mechanisms in the investment process.

The complexities of the investment process

The investment process, whereby needs and opportunities are converted through a construction project into a constructed asset, and all the mechanisms and enablers that go to make it, are very complex. What can make all the facets of the investment process harder to understand is that many of these mechanisms are not serial – they do not build up, one on another. This is unlike most university courses, where, for example, second-year mechanics builds on the theories and knowledge of first-year mechanics. The mechanisms and enablers of the investment process interconnect in a complex way. One way of visualising this is by means of the spider diagram shown in Figure 1.1. This diagram shows the mechanisms that are the subjects of this book and their interrelationships.

Chapter summary

- The differences between construction and manufacturing have a major influence on our systems and processes, particularly our standard forms of contract.
- A form of contract is constantly in use to manage construction projects.
- Effective construction processes depend on effective mechanisms.
- For success these mechanisms must be supported by enablers.
- The investment process is complex because it is so interconnected and not serial in its make-up.

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