Project Management in Construction
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As the sixth edition of this book makes its appearance, the challenge of managing construction projects to successful outcomes continues unabated throughout the world. Prestigious projects make the headlines: both those successful and those less so. The public’s imagination is captured by, for instance, constructions to accommodate great sporting events such as the Olympics and spectacular buildings such as Burj Khalifa and Shanghai Tower. But such projects overshadow the enormous amount of construction which contributes hugely to people’s well-being. The importance of developing all projects effectively, both public and private, is central to economy in using the world’s resources. Many factors impinge on success in this arena: development and utilisation of materials and new machines, training and education of a skilled workforce, political will and understanding of people’s needs, to name but a few.

A major need, central to effectively producing projects whatever their scale, is the organisation and management of people skilled in designing and building them. As with all previous editions of this book, this edition focuses further on proposing and using systems theory as the organisational approach suitable for this task and addresses the increasing complexity of the environments within which construction projects find themselves placed. In doing so, this edition has sought to explain how diverse approaches to organisation underpin systems theory and its relevance to construction project management as well as recognising the many competing paradigms and alternative perspectives available, for example in relation to differentiation and integration. Recognition has also been afforded to recent emergence of the study of temporary organisations arising in mainstream management and its relevance to construction project management.

Whilst encompassing the need to develop further theoretical aspects of construction project organisation theory, this edition has also enhanced application of organisation studies to practical issues of construction project management. More emphasis has been placed on the added complexity of construction project management by issues surrounding clients and stakeholders and by issues engendered by control and empowerment of project participants. Additional focus has been made on sustainability issues as they impinge on construction project management, on reworked views on supply chain management and on developments in partnering together with clarification of the shifting terms and definitions relating to construction organisation structures and their uses. Other general updating has been undertaken with some reorganisation of chapters and sections to aid continuity and clarity.

Six editions are not achieved without great indebtedness to colleagues from both academia and practice who have contributed enormously to my knowledge.
and understanding and who have provided encouragement over many years. I fully recognise their contribution, in particular my colleagues past and present from the University of Hong Kong and those who publish in the academic press in the field of construction project management in its widest sense. And, of course, once again my thanks are due to my wife for seeing me through this edition with forbearance and encouragement. Of course, only I am responsible for any faults that remain, but hope that this edition continues to make a contribution to the field.

Anthony Walker

Hoylake
1 Introduction

1.1 Introduction

The management of construction projects has been carried out since people first cooperated to erect buildings, yet there is little documented knowledge of how people interacted in this process. It is revealing that historical and contemporary accounts of construction work pay little attention to how people worked together and managed their activities. Writers over the ages have concentrated upon the buildings themselves, particularly on aesthetics, the use of new materials, technological developments and the impact of buildings on their environment. How people were organised and managed received scant attention until recent times. What was written tended to be about such charismatic characters of enormous ability as Brunel and Wren, and not about how they structured their organisations.

The way in which available skills are provided and used is of paramount importance in providing what clients expect from their projects. There is little point in the construction industry developing the special skills of its members if no one is going to amalgamate them in the best manner to meet a particular client's objective.

The conventional method of organisation for construction projects, by which is meant one in which the architect or engineer is the designer and manager of the process using specialist consultants with the construction contract awarded by competitive tender after the design is substantially complete, evolved in contexts (environments) that were considerably more stable than those faced today by both the construction industry and its clients. The complexity of the conditions within which the construction industry's clients now exist makes them place increasing demands upon the industry in terms of the performance of projects (both functionally and aesthetically), the capital and running costs, environmental and sustainability demands and the time required from conception of the project to occupation. This has come about as a result of technological developments, globalisation, uncertain economic conditions, social pressures, political instability, and so on. Such forces have led to the
emergence of stakeholders in projects: that is, organisations, institutions and individuals that are not formally clients but can claim a socially/commercially acceptable interest in projects which clients are required to acknowledge and respond to. Thus, generally, the term ‘client(s)’ used in this book also incorporates ‘stakeholder(s)’ as appropriate. The distinction between clients and stakeholders is covered in Chapter 4.

Within such conditions, clients from both private and public sectors have to increase their effectiveness to remain competitive and to satisfy their own clients who transmit the demands of a complex world to them. The construction industry has in turn to respond to demands from clients that arise from such conditions and is itself also subject to external pressures in a manner similar to that of its clients. It therefore needs to respond by mobilising the talents it possesses in a way which recognises the particular needs of individual clients. It has become clearly recognised that it is unreasonable to suppose that the conventional way of organising construction projects remains a universal solution to producing a project in today’s conditions.

The complexity of clients’ demands, together with the increasing complexity of building, civil and industrial engineering and other construction work, particularly as a result of technological developments, has over the years resulted in increasing specialisation within the construction industry. The professions associated with construction emerged as separate skills (e.g. architecture; quantity surveying; structural, mechanical and electrical engineering; acoustics and safety), as have the many specialist subcontractors. On any project, even a small one, large numbers of contributors and skills are involved. On the largest, there is a vast range of skills and materials required and an enormous variety of people and equipment to mobilise. Where these projects are carried out overseas, there are many additional issues of culture, logistics and language. Fundamental to the management of construction projects is therefore the way in which the contributors are organised so that their skills are used in the right manner and at the right time for the maximum benefit to the client. There is little point in the construction industry developing its skills if they are not then implemented effectively.

The way in which the industry and its skills and professions evolved has compounded the problem of organising effectively as it was reinforced by professional allegiances which, in the United Kingdom and elsewhere, were compounded by the establishment of professional institutions, which in turn contributed to the division of the design professions and their separation from construction firms. Specialisation has been accompanied by the creation of independent companies offering the specialisations, and the complexity of construction has led to greater interdependency between the specialisations and hence between companies. Whilst this has also led to the amalgamation of many specialist firms into multidiscipline firms, nevertheless, a high level of differentiation continues to exist within the construction process together with a consequent need for strong integration between independent specialist companies and between specialists within the multidisciplinary organisations.

It was against this background that the conventional solution to project organisation attempted to cope with increasing complexity and uncertainty leading to the development and increasing use of alternative approaches such as design-and-build, management contracting and construction management and initiatives such as partnering and prime contracting. There are now many
alternative forms of organisation for construction projects, but there remains
the need to select the most appropriate for each specific project. So what is
needed is a framework for designing an organisation structure to suit the par-
ticular project in the conditions in which it has to be executed. Pressure from
clients has made the professions and industry take more seriously the need for
organisation design, which is a key to the ability of the project management
process to be effective.

It should be clear by now that this book views a most important element of
project management as an organisational issue which incorporates the way in
which people are organised and managed in the project management process.
This is a long step from the view of project management still taken by many
who see it as a collection of planning and control techniques and other manage-
ment and decision-making tools which, historically, appear to be the root of
project management generally, particularly in the United States (Johnson 2013).
The distinction is important as the use of techniques and tools, however sophis-
ticated, will be of no avail if they are applied within inappropriate organisation
structures seeking to achieve misguided objectives. Objectives and organisation
must come first if the use of planning and control techniques is to be effective
in providing the information on which management decisions can be based.

While the terminology in this book is drawn from building rather than civil
engineering, the application of organisation theory is as relevant to civil engi-
neering as it is to building. The design of both civil engineering and building
project organisations will benefit from the application of the ideas arising
from the issues discussed here. Project management is now fully accepted as
fundamental to the success of projects by both sectors, demonstrating the
parallel need identified by sponsors and managers of projects. Further  progress
will be made through a fuller understanding of the basis of project  management,
which will arise from a wider knowledge of the theoretical work identified in
this book.

1.2 Evolution of Project Organisation

The way in which construction projects are organised in different countries has
evolved from traditions and conventions laid down in each country over many
years. The traditions and conventions of the United Kingdom have had a par-
ticularly wide significance as they have been exported to many parts of the
world over the last two centuries. A very brief account of project organisation
evolution in the United Kingdom may help to explain the position reached in
trying to develop more effective ways of managing construction projects. It will
have been paralleled in many other countries. Whilst many magnificent build-
ings were built in the United Kingdom in the centuries before the Industrial
Revolution using traditional methods of construction and organisation typical
of their time, the advent of the Industrial Revolution saw the beginning of revo-
lution in the way in which the buildings needed by the new industrialisation
were constructed and managed. The accompanying prosperity created demands
for buildings for the new industries, housing to accommodate both workers and
owners and demand for improved transportation all of which led to the devel-
opment of new engineering and building techniques. These activities created