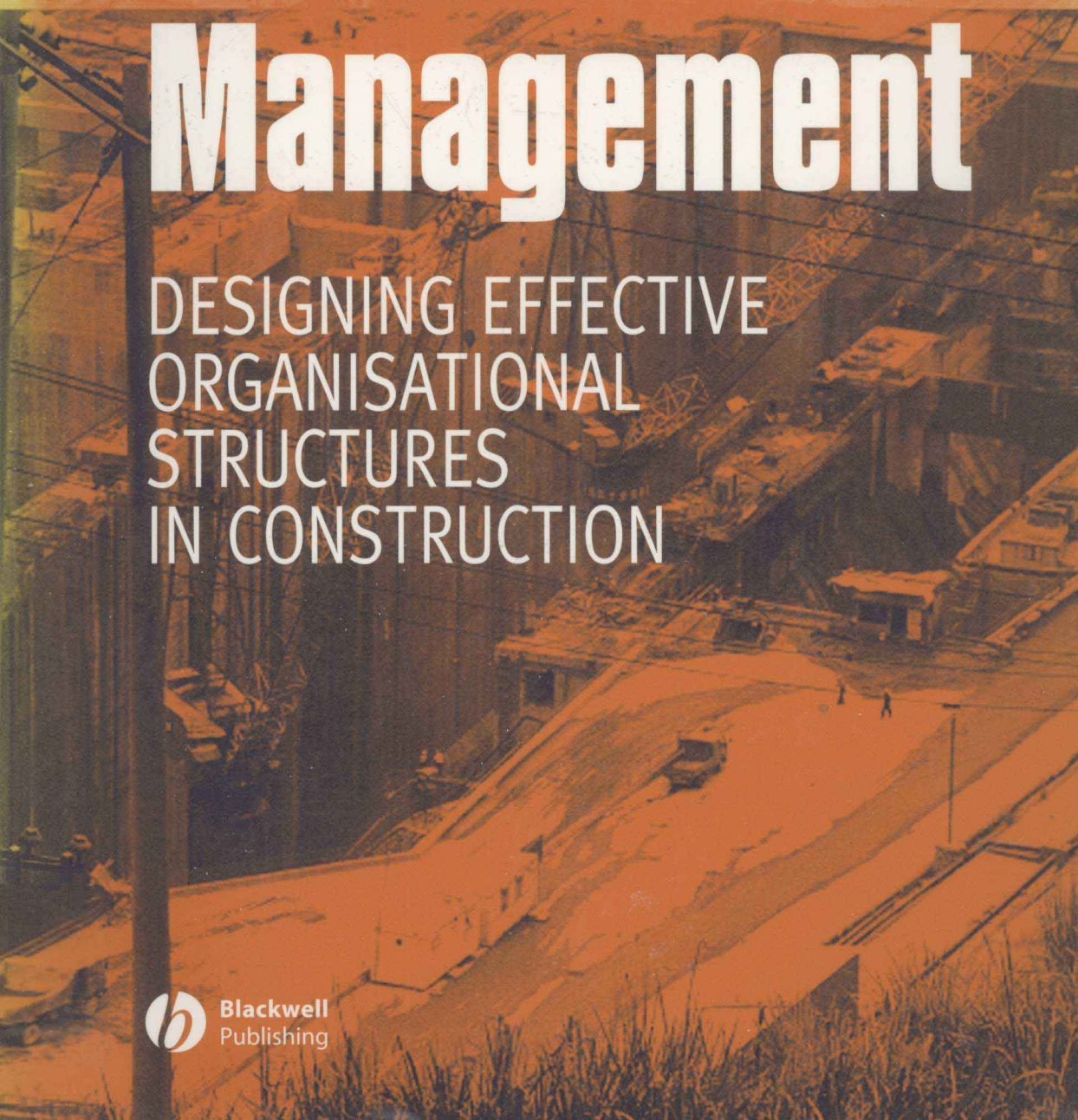
DAVID MOORE

PROJECT Management

DESIGNING EFFECTIVE ORGANISATIONAL STRUCTURES IN CONSTRUCTION



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UMIST

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Damnan quod non intelligent
They condemn what they do not understand.

PREFACE

Aims and objectives

Unfortunately, it is rarely possible to achieve a situation where a book will contain absolutely everything that individuals would benefit from knowing about the subject(s) being studied. This is mainly because, in the manner of projects themselves, a body of subject knowledge is always undergoing change – new ideas are added, old ideas are adapted or discarded and, perhaps most frustratingly, no single author ever knows absolutely everything about their subject.

Rather than trying to list all knowledge concerning the subject of organisation structure in a project management context, this book seeks to achieve two aims:

- examination of the diversity of factors to be considered in the determination of an initial overall organisation structure for a given project; and
- examination of the possibilities for varying organisation structure in response to differing project environments over the lifetime of a given project.

These aims may seem typical of books currently available on the subject of project management, many of which discuss the problem of organisation. However, this book is not about the typical project management issues. It will not, for example, provide illustrations of how to optimise project durations through the use of critical path networks (CPNs) – there is plenty of coverage of such techniques elsewhere.

Rather than reinvent the wheel, this book concentrates on the task of encouraging a project to unfold in a manner which is as close as possible to that which can be identified as most favourable to achieving success. The means of doing this is through the designing and implementing of an optimum organisation structure for a project, and

how the issue of organisation structure may make or break a project manager. A 'good' organisation structure will, as one example, be of significant benefit in achieving a project's optimum duration, whereas a 'bad' structure will be a significant hindrance. In neither case will there be any significant consideration of the number-crunching aspect of CPNs, PERT charts, and so on. There will, however, be consideration of how such techniques can be made aware of a project's structure requirements in the achieving of an optimised duration. In short, this book contains more discussion of organisation than is typical of a 'project management' book. It also contains quite a bit of discussion of some subjects that would not usually be expected in such a book.

Perhaps, then, the book is actually more relevant to the study of organisation (and organisations) than to project management. Again, there are many texts available that deal with the study of organisation and organisations, so there is little point in repeating much of what is already well covered elsewhere. There is no significant consideration, for example, of those over-arching needs of the majority of organisations to achieve immortality, grow in size, produce year-on-year improvements in performance, and so on. Quite the contrary: organisation is studied here from the perspective of creating something which has a definite lifetime, seeks not to grow beyond a certain size and aims to hit maximum performance as soon as possible, and then maintain it. In other words, this book deals solely with the study of organisation purely for projects and therefore falls into an area which lies between project management and the study of organisation – an area which has been poorly covered in the past.

A final point here is to identify the intended readership for the book. There is no intention to aim for the undergraduate-level market, as many of the concepts discussed are more appropriate to post-graduate-level study. Those who are currently functioning as project managers or have had recent experience of the role should find the book's content particularly useful and relevant, in that they will have encountered at least some of the points covered in a real-world context.

Objectives

The book has a number of objectives and these are grouped in the following manner:

- To provide tools for the identification of factors relevant to the development of an initial project organisation structure.
- To provide tools for the assessment of individual factors' significance in the operation of a project organisation structure.
- To advise on how the factors and their differing significances can be brought together to result in an initial project organisation structure.

These first three objectives can be regarded as a significant improvement on the traditional approach of simply imposing, for example, a matrix project organisation structure irrespective of what a specific project actually requires. These objectives are then followed by others:

- To provide techniques for identifying additional information requirements in order to further optimise the initial project organisation structure.
- To provide tools for the analysis of the additional information with regard to its impact on the initial structure.
- To advise on how to accommodate the additional information's impact on the initial structure so as to produce an intermediate structure.

These objectives should be viewed as an opportunity for the project manager to test the validity of the proposed organisation structure. There is the possibility of returning to the start of the process if any problems that emerge at this stage cannot be overcome. Essentially, a problem-prevention approach is being implemented rather than the more traditional problem-solving approach that is required when it is found that the imposed structure does not work. These objectives are then followed by these:

- To provide tools for identifying the extent of diversity for ways in which to implement the intermediate structure.
- To provide tools for the selection of the most relevant structure for each of the project's phases.
- To advise on achieving the project structure genome.

I hope that, after reading through the book, you will feel that all of the above objectives have been met. In order to place the various items covered within the book into a degree of order (but not control!), there are three main parts to the book. Each deals with the issue of organisation structure within a broad historical context. Part One, for

example, deals with approaches to structuring project organisations over a period up to the recent past. Part Two concentrates on what may be regarded as current approaches and Part Three introduces a possible new approach. It is in Part Three that most of the book's objectives will be met.

CONTENTS

PART I
STRUCTURE PAST

1 SEARCHING FOR THE REAL PROJECT: THE HISTORICAL APPROACH

Absus non tullit usum – misuse does not nullify proper use.

Introduction

Projects run on information. While it is true that information of itself cannot complete a project, in that it needs other resources to carry out the actual work, those resources can operate in a meaningful manner only when they are supplied with information. A bricklayer, for example, can lay bricks on the basis of his or her experience, but without project-relevant information there are many possibilities for error. These may range from minor errors, such as finishing the mortar joints in the wrong style, through to major errors such as building a wall to the wrong dimensions, in the wrong location, or using the wrong bricks. Information should allow processes to be performed effectively and efficiently. However, this is only the case when the information is relevant, complete and accurate. Information is therefore similar to the process by which it is distributed (communication) in that it can suffer from 'noise' – any factor which reduces its clarity and therefore its value. One of the points explored in later chapters (2 and 7) is the extent of an organisation structure's tolerance for information noise in comparison with the optimum tolerance for an individual project, but at this point it is sufficient to suggest that project organisation structures can play a key part in minimising or maximising noise with regard to the issue of project information.

This chapter examines what may be referred to as the traditional approach (which many organisations still seem to practise) in responding to noise as organisations attempt to define projects in terms of information. Some aspects of this approach have their roots in the mediaeval period, while others are (relatively) more contemporary, having emerged during the Industrial Revolution. A minority are

positively cutting edge, insofar as they were developed during the second half of the 20th century. This chapter should be regarded as outlining the baseline from which many organisations will have to develop if the forecasts of ever more rapid rates of change during the 21st century prove to be correct. The content of this chapter should also be regarded as a deliberate attempt to raise more questions than answers. This suggestion may disappoint some readers, but possible answers, along with further questions, should become apparent as they read subsequent chapters. Expertise does not arise instantaneously – it tends to require some effort. Sorry!

1.1 Information as a production resource

During the mediaeval period, all of the major projects being carried out anywhere in the world were construction projects (wars could also be included, but there were just too many of them!), and certainly as far as Europe was concerned, the most complex of these projects dealt with two products: cathedrals and castles. There were no major motorways, hydro-electric dams, high-rise office blocks or complex petro-chemical industrial facilities to be built. Likewise, there were relatively few construction materials to trouble those working in the industry. Brick had largely fallen out of use with the decline of the Roman Empire and would not become a major material again in Europe until the Renaissance was under way. Plastics and other synthetic materials were unknown, and the most common metal in use seems to have been lead. Mediaeval constructors required only minimal performance information on a small number of materials: stone, timber, glass and so on. Consequently, the industry could take a relatively relaxed approach to the generation and distribution of information, and even large projects were structured to reflect this.

The organising force on many large projects during this period was the master mason, a highly skilled individual who could find himself rewarded for a successful project with considerable prestige and influence. Masons in continental Europe could rise to levels equal to minor royalty and there were recorded instances where the mason had sufficient power to take complete control of a project through deposing the client (Moore, 2001). The mason's authority was also supported by his guild, with its strict rules for progression through the recognition of skills and abilities. These skills did not include the production of working drawings as generated by a modern-day architect; there was frequently no definitive design at the start of construction as the process was more along the lines of a shared vision

between mason and client. In some cases the sharing of the vision was achieved through the use of a model of the intended structure. Such models could be significant projects themselves as they were sufficiently large to allow the client to walk around inside them. Perhaps they should be regarded as an early example of the current trend to produce CAD images that allow the viewer to 'fly through' the proposed structure. Certainly they could be regarded as prototypes of the intended structure.

Drawings were produced as the work proceeded, with individual masons and other members of the team producing pieces of the overall structure under the instruction of the master mason. The production of information could not therefore be regarded as a team effort in the manner of a contemporary large project, and this resulted in a structure that was largely concerned with the use of information rather than its production and control. That information which was produced related to the project objectives as determined by the master mason, and as the objectives did not seem to change considerably between individual cathedrals, or castles, due to the lack of innovation within the industry, there seems to have been considerable potential for the recycling of information between projects.

1.1.1 Project objectives

Objectives for a project can be a nightmare, as anyone who has worked on a project having frequently changing (or 'revised') objectives will know. In this regard the situation the mediaeval mason faced, with his authority to determine project objectives in a minimalistic manner, could well seem an ideal one. Nonetheless, objectives are an essential part of any project, for two reasons:

- they determine the resources required for the project and the manner in which they are to be used;
- they are the basis on which project success or failure should be determined.

Over time, project objectives have grown more detailed and demanding. The mediaeval objective to produce the largest cathedral in the country, for example, is a relatively simple one so long as there is an agreed means of comparing the newly completed cathedral with whichever cathedral was the largest at the start of the construction process. If the client then starts adding objectives, such as to complete the building within a given budget and/or within a specific time pe-