

Construction Management in a Market Economy

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Acknowledgements

The nature of this book has meant that we have drawn on a large number of other resources and we acknowledge our indebtedness to all of them for their kindest support by allowing us to use their valuable resources, in particular, Takayaki Minato, John Kelly, Professor Vernon Ireland, Dr Selwyn Tucker and his colleagues, Professor Tony Sidwell and his colleagues, Glen Peters, Professor Chen Swee Eng. We also acknowledge our indebtedness to many commentators in construction management and management science who are too numerous to mention by name, but without whom this book could not have been written.

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Preface

I am delighted that Professor Denny McGeorge and Dr Patrick Zou of the University's Faculty of the Built Environment together with Dr Angela Palmer have as joint authors published this new book on Construction Management in both English and Chinese. All three authors have considerable experience working in Asia.

The University has a proud record of collaboration with its many friends and colleagues in China over a vast range of professional activities in both academic and governmental links and commercial enterprises. This growing partnership of co-operation builds on the expertise and experience that China and Australia possess, enabling special skills to be shared between the two countries.

The book is designed to assist and help students as well as practitioners in the vital area of the built environment and it will assist in the growing interchange of ideas and research linkages between China and Australia.

The University congratulates the authors and the Faculty on the signal achievement of publishing this book and of publishing it in Chinese and English.

A handwritten signature in black ink, appearing to read 'John Yu', with a stylized, flowing script.

John Yu AC

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Foreword

The purpose of writing this book *Construction Management in a Market Economy* is to introduce readers, in China, to the Western approach to procuring buildings. By procurement we mean the complete building cycle from the inception stage of a building project to the completion stage when the building is ready for occupation.

The three authors of this text, Emeritus Professor Denny McGeorge, Dr Angela Palmer and Dr Patrick Xiaowei Zou have a collective experience of both Western and Chinese approaches to construction management. Hopefully this experience has made us sympathetic to the needs of our Chinese readership. This book is not however an instruction manual of how to procure buildings in China. It would be presumptuous of us to make this claim. What the book does attempt to do, is to explain construction management techniques, as currently practised in the West, in a way that is meaningful to Chinese readers.

The book is intended to be topical and it brings together in a single volume the main new management techniques: *Benchmarking*, *Reengineering*, *Partnering*, *Value management*, *Constructability* and *Total quality management*. In the final chapter, "*Current construction management issues in Western and Chinese construction industry*", we have discussed some issues which are of current concern to the Chinese construction industry.

The book provides an objective account of management concepts and demonstrations how they interrelate. It will be of interest both to postgraduates in construction management and final year undergraduates in construction management and surveying, and to practitioners needing a readable introduction to these concepts.

It is perhaps worthwhile emphasising at this point, that there is no single unified Western approach to construction management. For example, when British companies tried to use the US system of value engineering they found that they couldn't make it work. The reasons for this were numerous but largely related to the original objectives of the value engineering studies. The US system of value engineering was born out of a need for greater accountability on government projects. Almost all value engineering activity in the US is government work. The situation in the UK was very different. The UK quantity surveying system (cost control system) provided all the accountability that was needed. Value engineering was required to provide a platform for the examination of value as opposed to cost. This is an illustration of how cultural differences between Western countries has lead to different approaches to the same management concept. Differences also exist between the American approach to Reengineering and the European approach.

It is to be anticipated that China will also develop its own versions of construction management concepts such as Reengineering, Total Quality Management, Benchmarking and Value Management. It may well be the case that some Western concepts may prove to be inappropriate in China due to cultural differences. We have not however filtered out Western concepts or management techniques on the grounds that some of these may not be suitable for the Chinese construction industry. Given that the Chinese construction sector is in a transitional phase of moving from the planned to the market economy we believe that it is important, in the first instance, that all concepts are considered even if in the longer term some of these concepts are not adopted.

It is also worthwhile emphasising at this point that the Chinese construction industry is also developing its own unique form of procurement with the introduction of the Tangible Construction Market (TCM). The TCM is an excellent example of process re-engineering and is discussed in detail later in this text.

In order to facilitate the Chinese readership, we have translated the text into Chinese and included the Chinese translation in this book. The fact that China has recently joined WTO (World Trade Organisation), means it is necessary to refer to the Western management techniques while enhancing their own strength to be more sustainably competitive. We sincerely hope that our efforts in producing this book will be of use to the readers, either in their research or construction project management practice.

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1 Introduction

The construction industry now faces substantial demands for improvements in quality and cost control and a reduction in contract disputes. A host of new management techniques has been promoted to help achieve this, but many in the industry find the concepts confusing and are sceptical about their usefulness.

Our purpose in writing this book was twofold. Firstly, we felt that there was a need to bring together, for the first time in a single volume, most, if not all of the management concepts currently being advocated for use in the construction industry. The concepts which we have selected for detailed scrutiny are: *benchmarking; reengineering; partnering; value management; constructability* and *total quality management*. Although we do not claim that this is a completely exhaustive coverage of the field, it is extensive and is more than sufficient for the second purpose of this book, which is to address the challenge of how to achieve a synergistic result from the multiple application of management concepts.

We are aware, from conversations with industry practitioners, that a good deal of healthy scepticism abounds with respect to the efficacy of modern management concepts. Many practitioners would be sympathetic to the view¹ that management concepts pass through a sequence of six phases. These are: deficiency of previous concepts; discovery or re-discovery of a solution; euphoria as early success stories are publicised; over extension due to the excessive application of the technique to inappropriate situations; derision as examples of failure grow too large to ignore; final abandonment as the technique is discarded or replaced with a new technique. Whilst we do not subscribe to this viewpoint, we feel that it is important to distinguish genuine cultural shifts in the industry from what can simply be trendy ideas. We are not alone in making this distinction, Godfrey² was also alert to this issue arguing that 'The use of partnering is growing fast, but there is a danger that this will be merely a passing fad'.

The book has been written against the backdrop of an industry who's decision takers now have an arsenal of management concepts at their disposal. Whilst the worth of such concepts such as total quality management, value management and benchmarking, are not in dispute, there is a real danger that practitioners in the

industry are becoming saturated and disillusioned by the number of management concepts which have emerged in the last decade, and with the apparent overlap which exists between them. In a recent survey carried out in Hong Kong³, it was found that a significant number of construction industry clients thought that 'value engineering was another name for a cost saving exercise, buildability study or one of the techniques of cost control'. This situation has been exacerbated by the fact that each new management concept has its own set of protagonists who advocate the adoption of 'their' concept to the exclusion of all others. Thus, from a practitioner's perspective, some concepts may appear to be mutually exclusive rather than complementary, with each new concept jockeying and jostling for the attention of the key decision takers. This aggressive promotion of a concept is typified by Hamer's slogan⁴ for re-engineering 'don't automate, obliterate' or Kelada's rhetorical question⁵ 'is re-engineering replacing total quality?'

We have attempted in this book to give a straightforward and objective account of the chosen concepts. This book is to inform industry practitioners and academics of the state of the art of construction management concepts and at the same time to provide a conceptual model which makes for a better understanding of the inter-relationship of current concepts and of concepts yet to be developed.

Throughout the book we have diligently tried to differentiate between concept as defined in *Webster's dictionary*⁶ as an abstract idea generalised from particular instances and technique, defined as a method of accomplishing a desired aim. The book deals in detail with both concepts and techniques, the philosophical learning is however, towards the conceptual.

The book's contents

Chapter Two: Benchmarking

Benchmarking is a concept aiming at improving the competitiveness of organisations through the examination and refinement of its business processes. The concept has its origins in Xerox Corporation who stripped down copiers manufactured by its competitors and compared them to their own. They later extended this comparison to include business processes of its competitors. The chapter looks at *types of benchmarking; the process of benchmarking; the benchmarking team and the benchmarking code of conduct*. The chapter concludes by illustrating a simple case study of benchmarking the customer focus of a national house-builder against a national car manufacturer.

Chapter Three: Reengineering

Reengineering is being hailed as a management revolution, which could have repercussions on the scale of the industrial revolution which followed Adam Smith's *Wealth of Nations*. The proponents of business process reengineering are

claiming quite dramatic results following its introduction. The full impact of reengineering is yet to be felt in the construction industry, although interest is gaining ground. The following aspects of reengineering are covered: *origins; reengineering in a construction industry context; goals; methodology; implementation; time and cost saving; pitfalls; IT and reengineering; a European perspective; and the T40 project*. The chapter contains a detailed case study, known as the T40 project, of the initiation, planning and implementation of a process reengineering in the Australian construction industry. The objective of the project was the reduction of construction process time by 40%.

Chapter Four: Partnering

The concept of formal partnering is of relatively recent origin, dating back to the mid 1980's. The concept was developed in the United States and has spread to other countries including Australia and New Zealand in the Southern Hemisphere and also to the UK. Parties adopting partnering resolve to move away from the traditional adversarial relationships to a 'win-win' situation. Partnering can either be undertaken at the level of a single project and be relatively short duration or can be of a semi-permanent nature at a strategic level. The chapter traces *the origins of partnering; partnering in a construction industry context; the goals of partnering; categories of partnering, project and strategic; the participants; commitment; the partnering process; how to conduct partnering workshops; partnering charters; the pitfalls of partnering; limits to partnering; legal and contractual implications of partnering; and dispute resolution*. The chapter ends by speculating on the likely uptake of partnering by the construction industry as a whole.

Chapter Five: Value management

Value management was developed in the United States manufacturing industry during the Second World War. Its aim was to improve the value of goods by concentrating on the functions that products perform. It was so successful in manufacturing that the United States Department of Defence began using it in the construction industry and it was around this time that an interest in value management was shown by the British construction industry. The chapter traces *the historical development of value management; the use of function analysis; organisation of value management studies; the evaluation of value management proposals; the American system of value management; the British system of value management; and the Japanese system of value management*. The chapter ends by analysing why these three systems are different and examines some of the major cultural influences on value management development.

Chapter Six: Constructability

Constructability is the only concept in this book which is the exclusive domain of the construction industry. Constructability is concerned with how decisions taken during the procurement process facilitate the ease of construction and quality of the completed project. From its inception in the early 1980's constructability has moved from its original narrow focus to incorporate decision support theory and decision support systems. The following aspects of constructability are covered: *the origins; scope and goals; implementation; constructability in practice; the building -in use; good and bad constructability - indicators of success; and quantifying the benefits of constructability.* The chapter concludes by distinguishing between constructability and good multi-disciplinary team working.

Chapter Seven: Total quality management

Total quality management or TQM is a concept aimed at improvement of the organisation through increased customer focus, integration of the organisations processes and a philosophy of continuous improvement. The chapter examines *definitions of TQM; historical development; the need for a cultural change in the construction industry; customer focus; integration; continuous improvement; quality costs and quality standards.* Finally the chapter briefly examined the array of quality methods that are currently available.

Chapter Eight: Current construction management issues in Western and Chinese construction industries

The chapter takes as its theme, the dominant message from market economies such as the United Kingdom and Australia that the key role of the government client is in activating a cultural shift in the industry through the strengthening and improvement of management practices. In Western economies this has lead to the adoption of management techniques such as benchmarking, total quality management, constructability, value management, partnering and reengineering. The counterpoint in China has been the introduction of initiatives such as the Tangible Construction Market (TCM). In this chapter we present a view of the current situation in which the burgeoning number of Western management concepts is seen to be a potential problem. The growth of facilities management and the changing relationships of the design and construction professions with the client are charted using the Pareto influence curve. We suggest that unpredictable social, economic, technical and political aspects of a globalising society will force organisations to look at forming national and trans-national business alliances. The proposition is made that project alliancing is one management practice which will become increasing popular in the coming decade. The chapter concludes by expressing the view that increased dialogue between Western and Chinese construction industries is essential for the common good and, that both systems have much to gain and learn from each other.

As mentioned in Foreword, it is perhaps worthwhile emphasising at this point, that there is no single unified Western approach to construction management. For example, when British companies tried to use the US system of value engineering they found that they couldn't make it work. The reasons for this were numerous but largely related to the original objectives of the value engineering studies. The US system of value engineering was born out of a need for greater accountability on government projects. Almost all value engineering activity in the US is government work. The situation in the UK was very different. The UK quantity surveying system (cost control system) provided all the accountability that was needed. Value engineering was required to provide a platform for the examination of value as opposed to cost. This is an illustration of how cultural differences between Western countries has lead to different approaches to the same management concept. Differences also exist between the American approach to Reengineering and the European approach.

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¹ Rigby D. (1993) The secret history of process engineering, *Planning Review* March/April; 24-27.

² Godfrey K.A. Jr., (editor). (1996) *Partnering in design and construction*. New York: McGraw-Hill.

³ Fong P.S.W. (1996) VE in construction: a survey of clients' attitudes in Hong Kong. *Proceedings of the Society of American Value Engineers International Conference*; Vol. 31.0.

⁴ Hammer M. (1990) Re-engineering work: Don't automate, obliterate. *Harvard Business Review*, July/August; 104-112.

⁵ Kelada J.N. (1994) Is re-engineering replacing total quality? *Quality in progress*, Dec; 79-83.

⁶ Webster's Third New International Dictionary 1976 Edition, Encyclopedia Britannica, Chicago.

2 Benchmarking

Introduction

In 1996 Michelle Smith, an Irish swimmer, confounded the swimming world by winning three gold medals at the Atlanta Olympic Games. When asked about the secret of her success she said, among other things, that she had learned the training methods of track and field athletes and applied these to her swimming training programme. Michelle's experience is not new. Other athletes have also looked outside their own sports for new techniques that have formed the basis of very successful training programmes. Emil Zatopeck, who was the only man ever to win three long distance athletic gold medals at one Olympic games, learned his techniques from the Army¹. Other athletes such as Ron Hill, one of the world's greatest marathon runners, used the carbohydrate loading diet invented by Swedish physiologists to improve his performance². Others are said to have lived on a diet that included turtle blood and ground rhinoceros horn.

What is common in all these experiences is that individuals looked outside the scope of their own sports or disciplines to find ways of improving. They were using the training methods already accepted in their own sports but these were not enough. Everybody was using them. In order to really succeed they needed something else. They needed a competitive edge.

Parallels for this can be seen in industry. For example when Henry Ford II was faced with rescuing a failing business he took new concepts of management from his competitor, General Motors³. However although there are examples like Ford, industries and companies are reluctant to look beyond their own sphere in order to find the competitive edge. For reasons of competitive fear, lack of resources or simple conservatism organisations tend to rely on the tried and trusted methods that exist within their own limited spheres. This is not to say that these tried and trusted methods are worthless: Michelle Smith was an international swimmer even without the track and field methods she introduced into her programme.

The message therefore is that the search for superiority is a three layered pyramid of success. In the case of the athlete it means they first must do the best that they can. Second they must do the best that others in their field can, by studying the training methods of other athletes. Finally they must do the best there is by

looking to the outside world and examining techniques in the fields of physiology, psychology and nutrition and apply these to their own training programmes.

This idea also applies to the management of a company. In order to gain competitive edge a company needs to look at itself first. It needs to examine its own systems and methods of working and make necessary improvements. It also needs to look at its own industry to learn the best methods from it and try to achieve those best practices itself. Finally it needs to look outside its own industry to learn the best methods from other industries and to try to achieve those best practices also.

This process of looking outside one's own sphere, be it to other divisions, companies or industries, is basically one of comparison. It would be pointless investigating other companies if the information gathered were not used as a standard against which to measure ones own performance. Once this comparison is made, however, and a performance gap established, it can be used as a basis for setting goals aimed at the of improvement of one's own practices.

This pyramid of success based on the comparison with others is the basis of benchmarking (Figure 2.1). Benchmarking is the comparison of practices either between different departments within the company, or with other companies in the same industry, or finally with other industries. The aim of benchmarking is to achieve superiority.

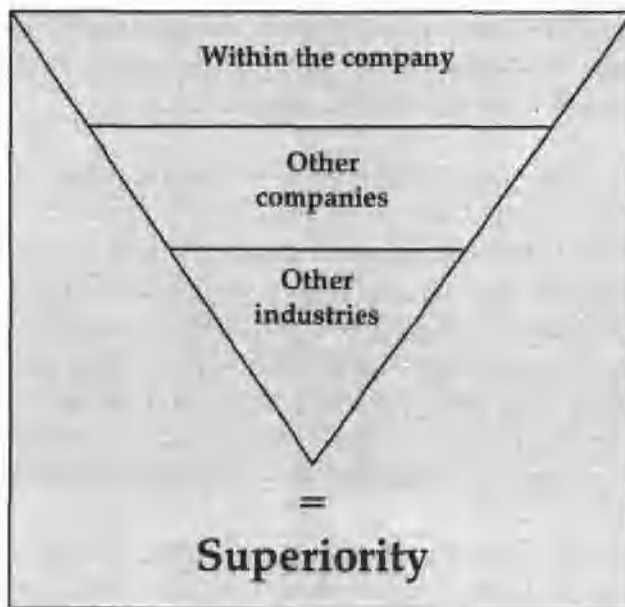


Figure 2.1 Benchmarking: The pyramid of success