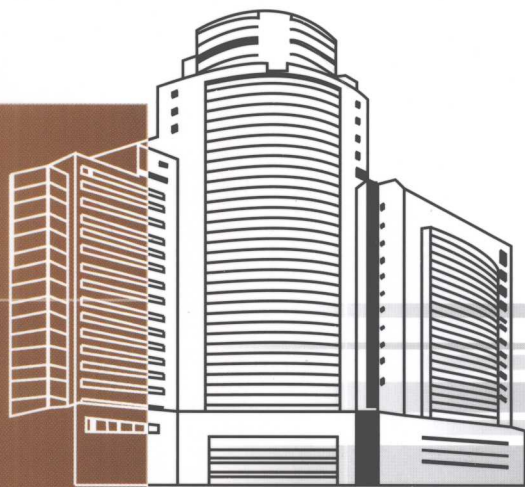




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21世纪全国应用型本科

土木建筑系列 实用规划教材



# 工程管理专业英语

主 编 王竹芳



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## 内 容 简 介

本书主要包括：项目管理组织；雇主；成本估算；项目预算；承包商；工程承包合同的类型；招标程序；项目融资；关键路径法；进度控制；创新和技术与经济的可行性；索赔、争端和仲裁；各类保证范例格式等。本书选材广泛、内容新颖、针对性强、难度适中，有助于提高读者阅读相关专业的英语书刊和文献的能力，以获取专业信息和掌握学科发展动态。

本书为高等院校工程管理专业本科学生学习专业英语而编写，亦可作为土木工程专业英语教材，同时也可供广大从事工程管理、土木工程，且具备一定英语基础的工程技术人员及自学者学习参考。

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## 丛书总序

我国高等教育发展迅速,全日制高等学校每年招生人数至2004年已达到420万人,毛入学率19%,步入国际公认的高等教育“大众化”阶段。面临这种大规模的扩招,教育事业的发展与改革坚持以人为本的两个主体:一是学生,一是教师。教学质量的提高是在这两个主体上的反映,教材则是两个主体的媒介,属于教学的载体。

教育部曾在第三次新建本科院校教学工作研讨会上指出:“一些高校办学定位不明,盲目追求上层次、上规格,导致人才培养规格盲目拔高,培养模式趋同。高校学生中‘升本热’、‘考研热’、‘考博热’持续升温,应试学习倾向仍然比较普遍,导致各层次人才培养目标难于全面实现,大学生知识结构不够合理,动手能力弱,实际工作能力不强。”而作为知识传承载体的教材,在高等教育的发展过程中起着至关重要的作用,但目前教材建设却远远滞后于应用型人才培养的步伐,许多应用型本科院校一直沿用偏重于研究型的教材,缺乏针对性强的实用教材。

近年来,我国房地产行业已经成为国民经济的支柱产业之一,随着本世纪我国城市化的大趋势,土木建筑行业对实用型人才的需求还将持续增加。为了满足相关应用型本科院校培养应用型人才的教學需求,从2004年10月北京大学出版社第六事业部就开始策划本套丛书,并派出十多位编辑分赴全国近三十个省份调研了二百多所院校的课程改革与教材建设的情况。在此基础上,规划出了涵盖“大土建”六个专业——土木工程、工程管理、建筑学、城市规划、给排水、建筑环境与设备工程的基础课程及专业主干课程的系列教材。通过2005年1月份在湖南大学的组稿会和2005年4月份在三峡大学的审纲会,在来自全国各地几十所高校的知名专家、教授的共同努力下,不但成立了本丛书的编审委员会,还规划出了首批包括土木工程、工程管理及建筑环境与设备工程等专业方向的四十多个选题,再经过各位主编老师和参编老师的艰苦努力,并在北京大学出版社各级领导的关心和第六事业部的各位编辑辛勤劳动下,首批教材终于2006年春季学期前夕陆续出版发行了。

在首批教材的编写出版过程中,得到了越来越多的来自全国各地相关兄弟院校的领导和专家的大力支持。于是,在顺利运作第一批土建教材的鼓舞下,北京大学出版社联合全国七十多家开设有土木建筑相关专业的高校,于2005年11月26日在长沙中南林业科技大学召开了《21世纪全国应用型本科土木建筑系列实用规划教材》(第二批)组稿会,规划了①建筑学专业;②城市规划专业;③建筑环境与设备工程专业;④给排水工程专业;⑤土木工程专业中的道路、桥梁、地下、岩土、矿山课群组近六十个选题。至此,北京大学出版社规划的“大土木建筑系列教材”已经涵盖了“大土建”的六个专业,是近年来全国高等教育出版界唯一一套完全覆盖“大土建”六个专业方向的系列教材,并将于2007年全部出版发行。

我国高等学校土木建筑专业的教育,在教育部和建设部的指导下,经土木建筑专业指导委员会六年来的研讨,已经形成了宽口径“大土建”的专业发展模式,明确了土木建筑专业教育的培养目标、培养方案和毕业生基本规格,从宽口径的视角,要求毕业生能从事

土木工程的设计、施工与管理的工作。业务范围涉及房屋建筑、隧道与地下建筑、公路与城市道路、铁道工程与桥梁、矿山建筑等，并且制定一整套课程教学大纲。本系列教材就是根据最新的培养方案和课程教学大纲，由一批长期在教学第一线从事教学并有过多年工程经验和丰富教学经验的教师担任主编，以定位“应用型人才培养”为目标而编撰，具有以下特点：

(1) 按照宽口径土木工程专业培养方案，注重提高学生综合素质和创新能力，注重加强学生专业基础知识和优化基本理论知识结构，不刻意追求理论研究型教材深度，内容取舍少而精，向培养土木工程师从事设计、施工与管理的应用方向拓展。

(2) 在理解土木工程相关学科的基础上，深入研究各课程之间的相互关系，各课程教材既要反映本学科发展水平，保证教材自身体系的完整性，又要尽量避免内容的重复。

(3) 培养学生，单靠专门的设计技巧训练和运用现成的方法，要取得专门实践的成功是不够的，因为这些方法随科学技术的发展经常改变。为了了解并和这些迅速发展的方法同步，教材的编撰侧重培养学生透析理解教材中的基本理论、基本特性和性能，又同时熟悉现行设计方法的理论依据和工程背景，以不变应万变，这是本系列教材力图涵盖的两个方面。

(4) 我国颁发的现行有关土木工程类的规范及规程，系1999年—2002年完成的修订，内容有较大的取舍和更新，反映了我国土木工程设计与施工技术的发展。作为应用型教材，为培养学生毕业后获得注册执业资格，在内容上涉及不少相关规范条文和算例。但并不是规范条文的释义。

(5) 当代土木工程设计，越来越多地使用计算机程序或采用通用性的商业软件，有些结构特殊要求，则由工程师自行编写程序。本系列的相关工程结构课程的教材中，在阐述真实结构、简化计算模型、数学表达式之间的关系的基础上，给出了设计方法的详细步骤，这些步骤均可容易地转换成工程结构的流程图，有助于培养学生编写计算机程序。

(6) 按照科学发展观，从可持续发展的观念，根据课程特点，反映学科现代新理论、新技术、新材料、新工艺，以社会发展和科技进步的新近成果充实、更新教材内容，尽最大可能在教材中增加了这方面的信息量。同时考虑开发音像、电子、网络等多媒体教学形式，以提高教学效果和效率。

衷心感谢本套系列教材的各位编著者，没有他们在教学第一线的教改和工程第一线的辛勤实践，要出版如此规模的系列实用教材是不可能的。同时感谢北京大学出版社为我们广大编著者提供了广阔的平台，为我们进一步提高本专业领域的教学质量和教学水平提供了很好的条件。

我们真诚希望使用本系列教材的教师和学生，不吝指正，随时给我们提出宝贵的意见，以期进一步对本系列教材进行修订、完善。

本系列教材配套的PPT电子教案以及习题答案在出版社相关网站上提供下载。

《21世纪全国应用型本科土木建筑系列实用规划教材》

专家编审委员会

2006年1月

# 前 言

随着世界经济全球化的深入发展, 工程项目管理也越来越国际化。我国加入 WTO 后工程项目管理面临的挑战和建筑业实施项目管理的实践表明我国的工程项目管理国际化是必然趋势, 中国工程项目管理的深化和推进必须进一步加快管理方式的国际化, 努力学习借鉴国际上先进的项目管理经验, 在学习中借鉴, 在借鉴中研究, 在研究中提升, 在提升中完善, 不断提高项目管理水平。

不论项目主体如何多元, 工程项目如何多样, 实行工程项目管理的国际化是共性的, 因此有必要向我国工程管理专业本科生以及工程管理从业人员提供并讲解国外相关资料, 帮助他们掌握更多新的专业知识, 提高他们的专业英语阅读能力。

本书主要取材于国际咨询工程师联合会(FIDIC)与世界银行编写的、通用于国际工程市场的正式出版物, 国外近几年工程管理领域的经典教材、专著。本书旨在使读者掌握工程管理专业英语知识, 培养和提高读者阅读专业英语文献资料的能力。读者在学习语言知识的同时, 可以了解相关专业知识。本书特点是选材较新, 实用性强, 适合作为高校工程管理专业英语教材, 也适用作为相关工程管理人员和工程技术人员的培训教材。

本书共分 16 个单元, 主要内容包括: 项目管理组织; 雇主; 成本估算; 项目预算; 承包商; 工程承包合同的类型; 招标程序; 项目融资; 关键路径法; 进度控制; 创新和技术与经济的可行性; 索赔、争端和仲裁; 各类保证范例格式等。内容覆盖面广, 系统性较强。在每一单元内, 均列出本单元相关的专业词汇, 并根据本单元重点内容提出问题, 读者在回答问题的同时, 可以巩固对课文的理解, 进而掌握相关专业知识。

本书的读者对象为普通高等院校工程管理专业及相关专业的学生, 以及从事工程管理的管理人员和技术人员等。

为了方便使用本书的教师和学生, 每单元都附有参考译文, 并附有教学课件和问题答案。

由于作者水平有限, 书中内容涉及面较广, 也由于我国高校开设相关专业的历史较短, 可供学习、参考、借鉴的资料不多见, 所以书中难免出现不足之处, 敬请专家和读者批评指正。

编 者  
2009 年 1 月

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# Unit 1 Organizing for Project Management

## Organization of Project Participants

The top management of the owner sets the overall policy and selects the appropriate organization to take charge of a proposed project. Its policy will dictate how the project life cycle is divided among organizations and which professionals should be engaged. Decisions by the top management of the owner will also influence the organization to be adopted for project management. In general, there are many ways to decompose a project into stages. The most typical ways are:

- Sequential processing whereby the project is divided into separate stages and each stage is carried out successively in sequence.
- Parallel processing whereby the project is divided into independent parts such that all stages are carried out simultaneously.
- Staggered processing whereby the stages may be overlapping, such as the use of phased design-construct procedures for fast track operation.

It should be pointed out that some decompositions may work out better than others, depending on the circumstances. In any case, the prevalence of decomposition makes the subsequent integration particularly important. The critical issues involved in organization for project management are:

- How many organizations are involved?
- What are the relationships among the organizations?
- When are the various organizations brought into the project?

There are two basic approaches to organize for project implementation, even though many variations may exist as a result of different contractual relationships adopted by the owner and builder. These basic approaches are divided along the following lines:

- **Separation of organizations.** Numerous organizations serve as consultants or contractors to the owner, with different organizations handling design and construction functions. Typical examples which involve different degrees of separation are: traditional sequence of design and construction; professional construction management.
- **Integration of organizations.** A single or joint venture consisting of a number of organizations with a single command undertakes both design and construction functions. Two extremes may be cited as examples: owner-builder operation in which all work will be handled in house by force account; turnkey operation in which all work is contracted to a vendor which is responsible for delivering the completed project.



The organization for the management of construction projects may vary from case to case. On one extreme, each project may be staffed by existing personnel in the functional divisions of the organization on an ad-hoc basis as shown in Figure 1.1 until the project is completed. This arrangement is referred to as the matrix organization as each project manager must negotiate all resources for the project from the existing organizational framework. On the other hand, the organization may consist of a small central functional staff for the exclusive purpose of supporting various projects, each of which has its functional divisions as shown in Figure 1.2 This decentralized set-up is referred to as the project-oriented organization as each project manager has autonomy in managing the project. There are many variations of management style between these two extremes, depending on the objectives of the organization and the nature of the construction project. For example, a large chemical company with in-house staff for planning, design and construction of facilities for new product lines will naturally adopt the matrix organization. On the other hand, a construction company whose existence depends entirely on the management of certain types of construction projects may find the project-oriented organization particularly attractive. While organizations may differ, the same basic principles of management structure are applicable to most situations.

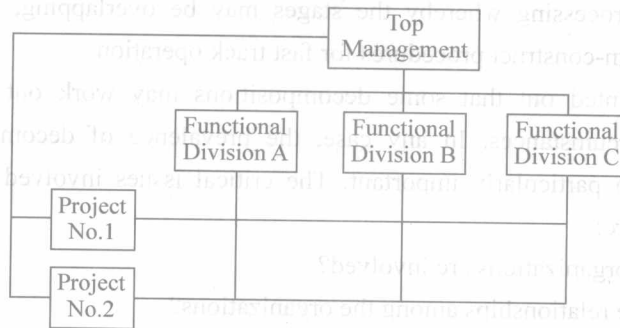


Figure 1.1 A Matrix Organization

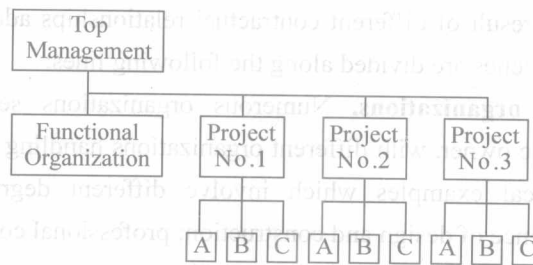


Figure 1.2 A Project-Oriented Organization

To illustrate various types of organizations for project management, we shall consider two examples, the first one representing an owner organization while the second one representing the organization of a construction management consultant under the direct supervision of the owner.

---

### Traditional Designer-Constructor Sequence

For ordinary projects of moderate size and complexity, the owner often employs a designer (an architectural/engineering firm) which prepares the detailed plans and specifications for the constructor (a general contractor). The designer also acts on behalf of the owner to oversee the project implementation during construction. The general contractor is responsible for the construction itself even though the work may actually be undertaken by a number of specialty subcontractors.

The owner usually negotiates the fee for service with the architectural/engineering (A/E) firm. In addition to the responsibilities of designing the facility, the A/E firm also exercises to some degree supervision of the construction as stipulated by the owner. Traditionally, the A/E firm regards itself as design professionals representing the owner who should not communicate with potential contractors to avoid collusion or conflict of interest. Field inspectors working for an A/E firm usually follow through the implementation of a project after the design is completed and seldom have extensive input in the design itself. Because of the litigation climate in the last two decades, most A/E firms only provide observers rather than inspectors in the field. Even the shop drawings of fabrication or construction schemes submitted by the contractors for approval are reviewed with a disclaimer of responsibility by the A/E firms.

The owner may select a general constructor either through competitive bidding or through negotiation. Public agencies are required to use the competitive bidding mode, while private organizations may choose either mode of operation. In using competitive bidding, the owner is forced to use the designer-constructor sequence since detailed plans and specifications must be ready before inviting bidders to submit their bids. If the owner chooses to use a negotiated contract, it is free to use phased construction if it so desires.

The general contractor may choose to perform all or part of the construction work, or act only as a manager by subcontracting all the construction to subcontractors. The general contractor may also select the subcontractors through competitive bidding or negotiated contracts. The general contractor may ask a number of subcontractors to quote prices for the subcontracts before submitting its bid to the owner. However, the subcontractors often cannot force the winning general contractor to use them on the project. This situation may lead to practices known as bid shopping and bid peddling. Bid shopping refers to the situation when the general contractor approaches subcontractors other than those whose quoted prices were used in the winning contract in order to seek lower priced subcontracts. Bid peddling refers to the actions of subcontractors who offer lower priced subcontracts to the winning general subcontractors in order to dislodge the subcontractors who originally quoted prices to the general contractor prior to its bid submittal. In both cases, the quality of construction may be sacrificed, and some state statutes forbid these practices for public projects.

Although the designer-constructor sequence is still widely used because of the public perception of fairness in competitive bidding, many private owners recognize the disadvantages

of using this approach when the project is large and complex and when market pressures require a shorter project duration than that which can be accomplished by using this traditional method.

### Professional Construction Management

Professional construction management refers to a project management team consisting of a professional construction manager and other participants who will carry out the tasks of project planning, design and construction in an integrated manner. Contractual relationships among members of the team are intended to minimize adversarial relationships and contribute to greater response within the management group. A professional construction manager is a firm specialized in the practice of professional construction management which includes:

- Work with owner and the A/E firms from the beginning and make recommendations on design improvements, construction technology, schedules and construction economy.
- Propose design and construction alternatives if appropriate, and analyze the effects of the alternatives on the project cost and schedule.
- Monitor subsequent development of the project in order that these targets are not exceeded without the knowledge of the owner.
- Coordinate procurement of material and equipment and the work of all construction contractors, and monthly payments to contractors, changes, claims and inspection for conforming design requirements.
- Perform other project related services as required by owners.

Professional construction management is usually used when a project is very large or complex. The organizational features that are characteristics of mega-projects can be summarized as follows:

- The overall organizational approach for the project will change as the project advances. The “functional” organization may change to a “matrix” which may change to a “project” organization (not necessarily in this order).
- Within the overall organization, there will probably be functional, project, and matrix suborganizations all at the same time. This feature greatly complicates the theory and the practice of management, yet is essential for overall cost effectiveness.
- Successful giant, complex organizations usually have a strong matrix-type suborganization at the level where basic cost and schedule control responsibility is assigned. This suborganization is referred to as a “cost center” or as a “project” and is headed by a project manager. The cost center matrix may have participants assigned from many different functional groups. In turn, these functional groups may have technical reporting responsibilities to several different and higher tiers in the organization. The key to a cost effective effort is the development of this project suborganization into a single team under the leadership of a strong project manager.
- The extent to which decision-making will be centralized or decentralized is crucial to

the organization of the mega-project.

Consequently, it is important to recognize the changing nature of the organizational structure as a project is carried out in various stages.

### Owner-Builder Operation

In this approach an owner must have a steady flow of on-going projects in order to maintain a large work force for in-house operation. However, the owner may choose to subcontract a substantial portion of the project to outside consultants and contractors for both design and construction, even though it retains centralized decision making to integrate all efforts in project implementation.

#### Example 1.1 U.S. Army Corps of Engineers Organization.

The District Engineer's Office of the U.S. Army Corps of Engineers may be viewed as a typical example of an owner-builder approach as shown in Figure 1.3.

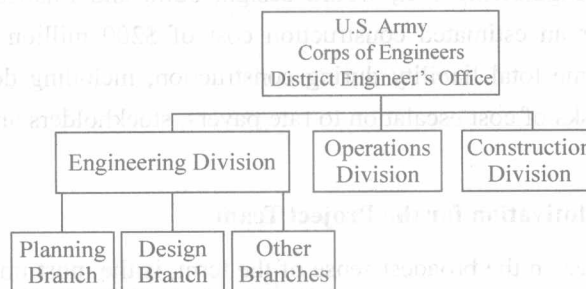


Figure 1.3 Organization of a District of Corps of Engineers

In the District Engineer's Office of the U.S. Corps of Engineers, there usually exist an Engineering Division and an Operations Division, and, in a large district, a Construction Division. Under each division, there are several branches. Since the authorization of a project is usually initiated by the U.S. Congress, the planning and design functions are separated in order to facilitate operations. Since the authorization of the feasibility study of a project may precede the authorization of the design by many years, each stage can best be handled by a different branch in the Engineering Division. If construction is ultimately authorized, the work may be handled by the Construction Division or by outside contractors. The Operations Division handles the operation of locks and other facilities which require routine attention and maintenance.

When a project is authorized, a project manager is selected from the most appropriate branch to head the project, together with a group of staff drawn from various branches to form the project team. When the project is completed, all members of the team including the project manager will return to their regular posts in various branches and divisions until the next project assignment. Thus, a matrix organization is used in managing each project.

### Turnkey Operation

Some owners wish to delegate all responsibilities of design and construction to outside

consultants in a turnkey project arrangement. A contractor agrees to provide the completed facility on the basis of performance specifications set forth by the owner. The contractor may even assume the responsibility of operating the project if the owner so desires. In order for a turnkey operation to succeed, the owner must be able to provide a set of unambiguous performance specifications to the contractor and must have complete confidence in the capability of the contractor to carry out the mission.

This approach is the direct opposite of the owner-builder approach in which the owner wishes to retain the maximum amount of control for the design-construction process.

#### Example 1.2 An Example of a Turnkey Organization.

A 150 MW power plant was proposed in 1985 by the Texas-New Mexico Power Company of Fort Worth, Texas, which would make use of the turnkey operation. Upon approval by the Texas Utility Commission, a consortium consisting of H.B. Zachry Co., Westinghouse Electric Co., and Combustion Engineering Inc., would design, build and finance the power plant for completion in 1990 for an estimated construction cost of \$200 million in 1990 dollars. The consortium would assume total liability during construction, including debt service costs, and thereby eliminate the risks of cost escalation to rate payers, stockholders and the utility company management.

#### Leadership and Motivation for the Project Team

The project manager, in the broadest sense of the term, is the most important person for the success or failure of a project. The project manager is responsible for planning, organizing and controlling the project. In turn, the project manager receives authority from the management of the organization to mobilize the necessary resources to complete a project.

The project manager must be able to exert interpersonal influence in order to lead the project team. The project manager often gains the support of his/her team through a combination of the following:

- Formal authority resulting from an official capacity which is empowered to issue orders.
- Reward and/or penalty power resulting from his/her capacity to dispense directly or indirectly valued organization rewards or penalties.
- Expert power when the project manager is perceived as possessing special knowledge or expertise for the job.
- Attractive power because the project manager has a personality or other characteristics to convince others.

In a matrix organization, the members of the functional departments may be accustomed to a single reporting line in a hierarchical structure, but the project manager coordinates the activities of the team members drawn from functional departments. The functional structure within the matrix organization is responsible for priorities, coordination, administration and final decisions

pertaining to project implementation. Thus, there are potential conflicts between functional divisions and project teams. The project manager must be given the responsibility and authority to resolve various conflicts such that the established project policy and quality standards will not be jeopardized. When contending issues of a more fundamental nature are developed, they must be brought to the attention of a high level in the management and be resolved expeditiously.

In general, the project manager's authority must be clearly documented as well as defined, particularly in a matrix organization where the functional division managers often retain certain authority over the personnel temporarily assigned to a project. The following principles should be observed:

- The interface between the project manager and the functional division managers should be kept as simple as possible.
- The project manager must gain control over those elements of the project which may overlap with functional division managers.
- The project manager should encourage problem solving rather than role playing of team members drawn from various functional divisions.

## Questions

1. What are the most typical ways to decompose a project into stages?
2. How many issues are involved in organization for project management? What are they?
3. Say about the two basic approaches to organization for project management. How these basic approaches are divided?
4. What's the matrix organization for the management of construction projects?
5. What's the project-oriented organization for the management of construction projects?
6. Summarize the organizational features that are characteristics of mega-projects.
7. Why is it important to recognize the changing nature of the organizational structure as a project is carried out in various stages?
8. What organization is used in managing the owner-builder project?
9. The project manager is the most important person for the success or failure of a project, why?
10. How does the project manager gain the support of his/her team?

## Vocabulary, Phrases and Expressions

project participants: 项目参与方

sequential processing: 串行处理; 顺序加工

parallel processing: 并行处理; 多重处理

staggered processing: 交叉处理; 错列处理

separation of organizations: 独立型组织  
integration of organizations: 集约型组织  
owner-builder operation: 业主自行建造项目  
turnkey operation: 交钥匙项目  
matrix organization: 矩阵式组织形式  
project-oriented organization: 以项目为导向的组织  
an architectural/engineering firm: 建筑/设计公司  
a general contractor: 总承包商  
specialty subcontractors: 专业分包商  
supervise: 监理  
field inspectors: 现场检查员  
field observers: 现场观察员  
shop drawings of fabrication: 车间安装图  
construction schemes: 施工计划; 施工安排  
designer-constructor sequence: 设计施工顺序模式  
subcontract: 分包合同  
quality of construction: 建筑质量  
construction management: 施工管理  
design and construction alternatives: 设计或施工的替代方案  
project cost and schedule: 项目的成本和进度  
procurement of material and equipment: 材料和设备的采购  
monthly payments: 月度付款  
cost center: 成本中心  
decision-making: 决策  
on-going projects: 在建项目  
engineering division: 工程设计部门  
operations division: 运营部门  
construction division: 施工部门  
outside contractors: 外部承包商  
authorization: 授权  
feasibility study of a project: 项目可行性研究  
project team: 项目团队  
performance specifications: 设计任务说明书; 规范(规格说明书)  
liability during construction: 建设期债务  
debt service: 还本付息; 偿债  
project manager: 项目经理

## 参考译文

### 第 1 单元 项目管理组织

#### 项目各参与方的组织

业主的高层管理负责设定总体方针，同时选择合适的组织来负责给定的项目。在业主的方针中会指出如何将项目生命周期中的任务划分给不同的组织，以及聘用什么样的专业人员。业主高层管理所做出的决策也将对被选出进行项目管理的组织产生影响。通常会有多种分解项目阶段的方法，其中最为典型的是：

- 顺序划分，项目被划分成独立的几个阶段，各阶段按连续顺序进行。
- 平行划分，项目被划分成独立的几个部分，各部分同时进行。
- 交叉划分，项目阶段可以进行搭接。例如，快速路径法的应用。

这里需要指出的是哪种分解方法更为有效，这完全取决于项目的具体情况。在多数情况下，按顺序划分的方法更为普遍一些。涉及项目管理的关键问题有：

- 项目涉及多少个组织？
- 各组织间的联系是什么？
- 各组织何时介入项目？

尽管由于业主和承包商之间所采用合同条件的不同会产生很多种完成项目的组织形式，但基本形式只有两种，并按照下面的思路来划分。

- **独立型组织**。相对于业主，会出现咨询方或承包商等多种分别处理设计和施工任务的组织，涉及这种类型组织的典型例子有：设计和施工的传统顺序模式；专业化的建设项目管理模式。
- **集约型组织**。由不同组织组成一个单一的联合体，以统一指令来承担设计和施工任务。这里介绍两种极端的例子：业主自行建造项目，在这里所有工作均由业主内部部门处理；交钥匙项目，即合同的所有工作内容都交给一个卖方，由他负责向业主提交完工项目。

建设项目的管理组织形式可视具体情况而定。一种情况是，项目所需人员由职能部门提供，由专职项目经理领导直至项目结束，如图 1.1 所示。在这种形式下，项目经理必须从现有的组织框架中协调并获取项目所需的各种资源，因而这种组织形式也被称为矩阵式组织。而另一种组织形式是如图 1.2 所示的直线式组织，在这种组织形式下，组织为每一个项目提供资源上的必要支持，因而也被称为以项目为导向的组织，每位项目经理都有管理项目的自治权。除此之外，还有其他类型的项目组织可供选择，这取决于组织目标和建设项目的特点。例如，一家由内部力量来计划、设计和建设新产品设备的大型公司很自然地会选择矩阵式组织。然而，完全依靠建设项目管理求生存的建筑公司，却倾向于选择以项目为导向的组织。尽管组织形式有所不同，但管理结构的基本原则却适用于大多数情况。



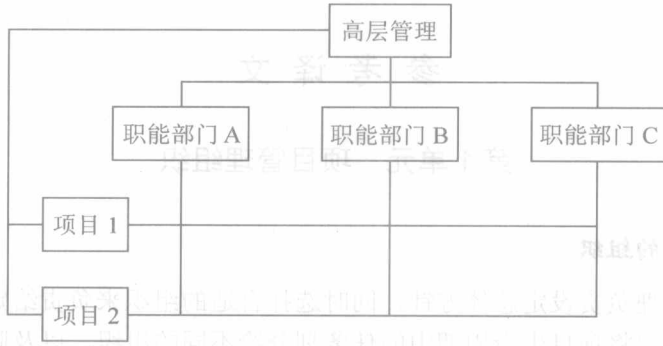


图 1.1 矩阵式组织

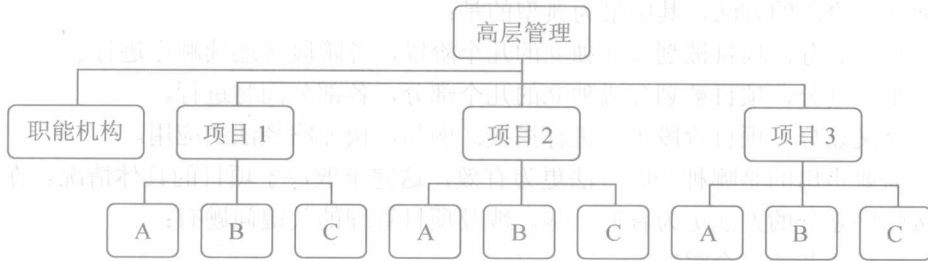


图 1.2 以项目为导向的组织

为了理解项目管理的不同组织形式，可以认为第一个例子所代表的是一个业主的管理组织，而第二个例子所代表的是一个业主直接监督下的建筑管理咨询方的管理组织。

**传统的设计—承包模式**

对于那些规模和复杂程度适中的普通项目，业主通常会选择一家设计单位(建筑设计公司)为承包商(总承包商)提供项目所需的详细规划和设计。设计单位同时代表业主在施工期间监督项目的执行。尽管具体工作由众多的专业分包商来承担，但却由总承包商对工程本身负责。

业主通常会跟建筑/设计(A/E)公司进行服务费用的谈判。除了承担设计责任外，A/E 公司还行使一定程度的、由业主规定的、监督施工的职责。传统上，A/E 公司是把自己当作业主代表，并且不和潜在的承包商直接联系，以回避利益冲突的专业设计咨询人员。为 A/E 公司工作的现场监督人员通常在设计完成之后对项目实施跟踪检查，并且很少直接参与设计本身。由于在过去 20 年里诉讼之风渐盛，为避免诉讼纠纷，大多数的 A/E 公司只向工地派观察员，而不再派现场监督。现在，由承包商提交获准的车间安装详图和项目计划，也被视作 A/E 公司推卸责任。

业主既可通过竞争性招标也可通过谈判来选择总承包商。一般公共机构被要求使用竞争性招标方式，而私人组织可采用两种方式中的任何一种。在竞争性招标中，业主将不得不采用设计—施工顺序模式，因为在邀请竞标者投标前，详细的规划和设计应已完成。如果采用谈判的合同方式，那么业主在选择建造模式方面有很大的余地。

总承包商可选择自己完成建设项目的全部工作或其中的一部分，也可以把建设项目全部分包给分包商，自己只作为管理者。总承包商同样既可用竞争性招标也可通过谈判来选