

第二部分项目管理知识领域 [KNOWLEDGE AREAS]

第五章 项目内容管理 [Scope]

Project Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully (1). It is primarily concerned with defining and controlling what is or is not included in the project. Figure 5-1 provides an overview of the major project scope management processes:

5.1 Initiation—authorizing the project or phase.

5.2 Scope Planning—developing a written scope statement as the basis for future project decisions.

5.3 Scope Definition—subdividing the major project deliverables into smaller, more manageable components.

5.4 Scope Verification—formalizing acceptance of the project scope.

5.5 Scope Change Control—controlling changes to project scope.

These processes interact with each other and with the processes in the other knowledge areas as well. Each process may involve effort from one or more individuals or groups of individuals, based on the needs of the project. Each process generally occurs at least once in every project phase.

Although the processes are presented here as discrete components with well defined interfaces, in practice they may overlap and interact in ways not detailed here. Process interactions are discussed in detail in Chapter 3.

In the project context, the term scope may refer to:

Product scope—the features and functions that characterize a product or service.

Project scope—the work that must be done to deliver a product with the specified features and functions.

The processes, tools, and techniques used to manage project scope are the focus of this chapter. The processes, tools, and techniques used to manage product scope vary by application area and are usually defined as part of the project life cycle (the project life cycle is discussed in Section 2.1).

A project generally results in a single product, but that product may include subsidiary components, each with its own separate but interdependent product scopes. For example, a new telephone system would generally include four subsidiary components—hardware, software, training, and implementation.

Completion of the project scope is measured against the project plan, but completion of the product scope is measured against the product requirements. Both types of scope management must be well integrated to ensure that the work of the project will result in delivery of the specified product.

项目范围管理包括保证项目包含且仅包含所有为顺利完成项目所需的全部工作所需要的过程。它主要涉及定义及控制项目应该包括或不包括的内容。图 5-1 提供了主要项目范围管理过程的概要：

- 5.1 启动——批准项目或项目阶段
- 5.2 范围计划编制——编制一个书面的范围说明，作为将来项目决策的依据
- 5.3 范围定义——将项目可交付成果分解成若干小的、容易管理的单元
- 5.4 范围核实——将项目范围正式接受
- 5.5 范围变更控制——控制范围变更

这些过程之间及其与其他知识领域的过程之间彼此互相影响。根据项目需要，每个过程可能会需要一个或多个个体或团体的努力。在每个项目阶段，每个过程通常至少发生一次。

尽管这里提到的这些过程是作为各自独立的因素给予了明确的界定，但是，在实践中它们是以各种形式重迭和影响的。有关过程之间的互相影响在第 3 章中作了详细的讨论。





5.1 启动[INITIATION]

Initiation is the process of formally authorizing a new project or that an existing project should continue into its next phase (see Section 2.1 for a more detailed discussion of project

phases). This formal initiation links the project to the ongoing work of the performing organization. In some organizations, a project is not formally initiated until after completion of a needs assessment, a feasibility study, a preliminary plan, or some other equivalent form of analysis that was itself separately initiated. Some types of projects, especially internal service projects and new product development projects, are initiated informally, and some limited amount of work is done to secure the approvals needed for formal initiation. Projects are typically authorized as a result of one or more of the following:

A market demand (e.g., a car company authorizes a project to build more fuel efficient cars in response to gasoline shortages).

A business need (e.g., a training company authorizes a project to create a new course to increase its revenues).

A customer request (e.g., an electric utility authorizes a project to build a new substation to serve a new industrial park).

A technological advance (e.g., an electronics firm authorizes a new project to develop a video game player after advances in computer memory).

A legal requirement (e.g., a paint manufacturer authorizes a project to establish guidelines for the handling of toxic materials).

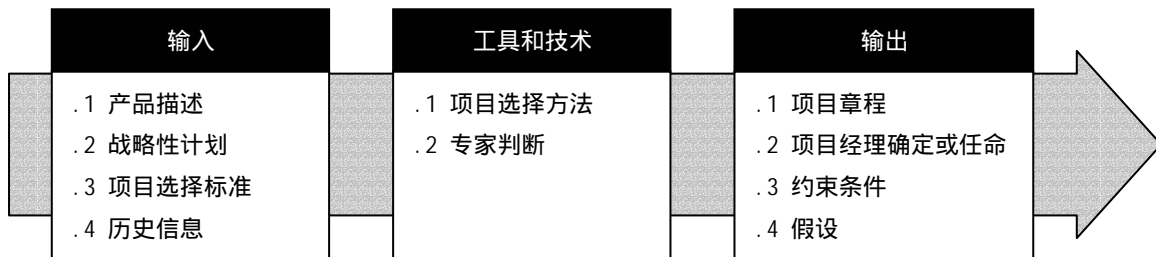
A social need (e.g., a nongovernmental organization in a developing country authorizes a project to provide potable water systems, latrines, and sanitation education to low-income communities suffering from high rates of cholera).

These stimuli may also be called problems, opportunities, or business requirements. The central theme of all these terms is that management generally must make a decision about how to respond.

启动是正式批准一个新项目或者批准一个已存在的项目可以进入下一阶段的过程(2.1节对项目阶段有详细的阐述)。项目的正式启动将项目与执行组织的常规工作相联系。在某些组织中,只有在需求评估、可行性研究、初步计划或其他单独启动的同等分析完成以后,项目才能正式启动。某些类型的项目,特别是内部服务项目或新产品开发项目,可能先进行一些为获得正式启动所需批准的工作,从而非正式启动。项目通常是由于以下的需要而被批准的:

- 市场需求(比如:某汽车公司针对市场上汽油短缺,批准一个项目研制更省油的汽车)。
- 商业需求(比如:一个培训公司批准编制一个新的课程来增加其收入)。
- 顾客要求(比如:一家电力公司核准一个建一家新的变电站的项目,向一个新的工业开发区提供电力资源)。
- 技术领先需求(比如:一家电子公司在计算机内存不断增加的情况下,批准开发一个新的视频游戏机)。
- 法律要求(比如:涂料生产厂家核准的项目建立一个处理有毒物品的指导方针)。
- 社会需求(比如:一个发展中国家的民间组织批准一个项目,向霍乱高发的低收入社区提供饮用水系统、公共厕所和卫生教育)。

这些动因也可能被称为是问题、机遇或商业需求。无论叫什么,其核心的问题是管理部门通常要做出应对的决策。



5.1.1 启动过程的输入[Inputs to Initiation]

. 1 Product description. The product description documents the characteristics of the product or service that the project was undertaken to create. The product description will generally have less detail in early phases and more detail in later ones as the product characteristics are progressively elaborated. The product description should also document the relationship between the product or service being created and the business need or other stimulus that gave rise to the project (see the list in Section 5.1). While the form and substance of the product description will vary, it should always be detailed enough to support later project planning.

Many projects involve one organization (the seller) doing work under contract to another (the buyer). In such circumstances, the initial product description is usually provided by the buyer.

. 2 Strategic plan. All projects should be supportive of the performing organization's strategic goals—the strategic plan of the performing organization should be considered as a factor in project selection decisions.

. 3 Project selection criteria. Project selection criteria are typically defined in terms of the merits of the product of the project and can cover the full range of possible management concerns (financial return, market share, public perceptions, etc.).

. 4 Historical information. Historical information about both the results of previous project selection decisions and previous project performance should be considered to the extent that it is available. When initiation involves approval for the next phase of a project, information about the results of previous phases is often critical.

1. 产品描述：产品描述把项目将要创造的产品或服务的特征编制成文档。产品描述通常在项目工作的早期阶段不详细，而在后续阶段随着产品特征的逐步详尽而细化。

产品描述也应该记载已生产出的产品或服务同商业需求或其他导致项目产生原因之间的关系，它会对项目产生积极的影响（见 5.1 列表）。尽管产品描述的形式和内容是多种多样的，但是，它们都应详细到能够支持后续的项目计划编制的程度。

许多项目都包括一个按一个组织（买方）的合同进行工作的组织（卖方）。在这种情况下，最初的产品描述通常是由买方提供。

2. 战略性计划：所有的项目应服从项目执行组织的战略目标--在项目决策的选择中，执行组织的战略性计划应该作为一个考虑的因素。

3. 项目选择标准：项目选择标准通常是通过项目产品的价值界定的，它涉及到管理可能包含的全部范围（如：投资回报、市场份额和公众接受程度等）。

4. 历史信息：应当尽可能的考虑以前项目选择决策的结果和项目绩效的历史信息。当项目启动涉及对项目下一阶段工作的批准时，有关前阶段结果的信息通常是非常重要的。

5.1.2 启动过程的工具和技术[Tools and Techniques for Initiation]

.1 Project selection methods. Project selection methods involve measuring value or attractiveness to the project owner. Project selection methods include considering the decision criterion (multiple criteria, if used, should be combined into a single value function) and a means to calculate value under uncertainty. These are known as the decision model and calculation method. Project selection also applies to choosing the alternative ways of doing the project. Optimization tools can be used to search for the optimal combination of decision variables. Project selection methods generally fall into one of two broad categories (2):

Benefit measurement methods—comparative approaches, scoring models, benefit contribution, or economic models.

Constrained optimization methods—mathematical models using linear, nonlinear, dynamic, integer, and multi-objective programming algorithms.

These methods are often referred to as decision models. Decision models include generalized techniques (Decision Trees, Forced Choice, and others), as well as specialized ones (Analytic Hierarchy Process, Logical Framework Analysis, and others). Applying complex project selection criteria in a sophisticated model is often treated as a separate project phase.

.2 Expert judgment. Expert judgment will often be required to assess the inputs to this process. Such expertise may be provided by any group or individual with specialized knowledge or training, and is available from many sources, including:

Other units within the performing organization.

Consultants.

Stakeholders, including customers.

Professional and technical associations.

Industry groups.

1. 项目选择方法：项目选择方法通常包括测量该项目对于项目业主的价值或吸引力。选择方法要考虑决策标准（如果使用多项标准，则应当把这些标准综合到一个单值函数）和不确定条件下价值的计算方法，这些称为决策模型和计算方法。项目选择方法也用来选择项目进行中各种备选方案。各种优化工具可以用来搜索决策变量的最优组合，通常项目选择方法可以分为两大类：

- 收益测量法—包括比较法、计分模型、收益分布或经济模型。
- 约束优化法—使用线性的、非线性的、动态的、整数及多目标编程等算法的数学模型。

这些方法通常被称为决策模型。决策模型既包括常规技术（决策树、强制选择法等），也包括特殊技术（层次分析法、逻辑框图分析法等）。在一个高级模型中应用复杂的项目选择准则经常被作为一个独立的项目阶段。

2. 专家判断：评估启动过程的输入经常需要专家判断。这些专家的意见可以通过一个组织或拥有特殊知识和受了专门培训的个人来提供，可以通过许多途径获得。包括：

- 执行组织中的其他单位
- 咨询公司
- 项目干系人，包括客户
- 专业团体和技术协会
- 工业团体

5.1.3 启动过程的输出[Outputs from Initiation]

. 1 Project charter. A project charter is a document that formally authorizes a project. It should include, either directly or by reference to other documents:

The business need that the project was undertaken to address.

The product description (described in Section 5.1.1.1).

The project charter should be issued by a manager external to the project, and at a level appropriate to the needs of the project. It provides the project manager with the authority to apply organizational resources to project activities.

When a project is performed under contract, the signed contract will generally serve as the project charter for the seller.

. 2 Project manager identified/assigned. In general, the project manager should be identified and assigned as early in the project as is feasible. The project manager should always be assigned prior to the start of project plan execution (described in Section 4.2) and preferably before much project planning has been done (the project planning processes are described in Section 3.3.2).

. 3 Constraints. Constraints are factors that will limit the project management team's options. For example, a predefined budget is a constraint that is highly likely to limit the team's options regarding scope, staffing, and schedule.

When a project is performed under contract, contractual provisions will generally be constraints. Another example is a requirement that the product of the project be socially, economically, and environmentally sustainable, which will also have an effect on the project's scope, staffing, and schedule.

. 4 Assumptions. See Section 4.1.1.5.

1. 项目章程：项目章程是正式批准一个项目存在的文档，它应该直接或通过参见其他文件，包括以下文档：

- 项目要满足的商业需求
- 产品描述（在 5.1.1.1 节中已做描述）

项目章程应当由项目以外的负责人发布，其地位要根据项目的需求而定。项目章程授权项目经理为执行项目活动而使用组织资源的权利。

当项目在合同环境下执行时，所签定的合同常作为卖方的项目章程。

2. 指定/委派的项目经理：通常应该在可行的前提下尽可能早的确定项目经理。项目经理的任命应在开始执行项目计划（在 4.2 中阐述）前，最好是在计划编制过程（在 3.3.2 中阐述）的大部分工作完成之前。

3. 约束条件：约束条件就是那些制约项目管理团队选择的因素。例如：事先确定的预算是限制项目团队对范围、职员调配和进度计划的一个很重要的因素。

当一个项目按照合同执行时，合同条款通常成为约束条件。再比如，要求项目产品具有社会、经济 and 环境的可持续性，这一要求也会对项目范围、项目人员配置和进度计划产生影响。

4. 假设：见 4.1.1.5 节

5.2 范围计划编制[SCOPE PLANNING]

Scope planning is the process of progressively elaborating and documenting the project work (project scope) that produces the product of the project. Project scope planning starts with the initial inputs of product description, the project charter, and the initial definition of constraints and assumptions. Note that the product description incorporates product requirements that reflect agreed-upon customer needs and the product design that meets the product requirements. The outputs of scope planning are the scope statement and scope management plan, with the supporting detail. The scope statement forms the basis for an agreement between the project and the project customer by identifying both the project objectives and the project deliverables. Project teams develop multiple scope statements that are appropriate for the level of project work decomposition.

范围计划编制是将生产项目产品所需进行的项目工作（项目范围）渐进明细和形成文件的过程。项目范围计划编制始于最初的输入，如产品描述、项目章程、各种约束和假设的最初定义等。注意，产品描述包括产品要求和产品设计，产品要求应反映已经达成共识的客户要求，产品设计要满足上述产品要求。范围计划编制的输出有范围说明和范围管理计划，并带有详细依据。范围说明通过确定项目目标和主要的项目可交付成果，为项目团队与项目顾客间达成协议奠定了基础。项目团队制定与项目工作分解层次相适应的多个范围说明。



5.2.1 项目计划执行的输入[Inputs to Scope Planning]

- .1 **Product description.** The product description is discussed in Section 5.1.1.1.
- .2 **Project charter.** The project charter is described in Section 5.1.3.1.
- .3 **Constraints.** Constraints are described in Section 5.1.3.3.
- .4 **Assumptions.** Assumptions are described in Section 4.1.1.5.

1. **产品描述**：产品描述在 5.1.1.1 节中阐述。

2. **项目章程**：项目章程在 5.1.3.1 节中阐述。

3. **约束条件**：约束条件在 5.1.3.3 节中阐述。
4. **假设**：假设在 4.1.1.5 节中阐述。

5.2.2 范围计划编制的工具和技术[Tools and Techniques for Scope Planning]

.1 **Product analysis**. Product analysis involves developing a better understanding of the product of the project. It includes techniques such as product breakdown analysis systems engineering, value engineering, value analysis, function analysis, and quality function deployment.

.2 **Benefit/cost analysis**. Benefit/cost analysis involves estimating tangible and intangible costs (outlays) and benefits (returns) of various project and product alternatives, and then using financial measures, such as return on investment or payback period, to assess the relative desirability of the identified alternatives.

.3 **Alternatives identification**. This is a general term for any technique used to generate different approaches to the project. There is a variety of general management techniques often used here, the most common of which are brainstorming and lateral thinking.

.4 **Expert judgment**. Expert judgment is described in Section 5.1.2.2.

1. **产品分析**：产品分析是为了对项目产品有一个更好的理解。它包括这样一些技术，如：产品分解分析系统工程、价值工程、价值分析、功能分析和质量功能等。

2. **收益/成本分析**：收益/成本分析是对各种项目和产品方案可见成本和潜在成本（支出）与利润（收益）进行估算，然后用投资收益率或投资回收期等财务方法，评估这些经确认的选择方案相对预期。

3. **备选方案确定**：他是一个通用术语，描述的是项目产生不同的方案的所有技术。这里常用的是通用的各种管理技术，最常用的有：“头脑风暴”和“横向思维”法。

4. **专家判断**：专家判断在 5.1.2.2 节中阐述。

5.2.3 范围计划编制过程的输出[Outputs from Scope Planning]

.1 **Scope statement**. The scope statement provides a documented basis for making future project decisions and for confirming or developing common understanding of project scope among the stakeholders. As the project progresses, the scope statement may need to be revised or refined to reflect approved changes to the scope of the project. The scope statement should include, either directly or by reference to other documents:

Project justification—the business need that the project was undertaken to address. The project justification provides the basis for evaluating future tradeoffs.

Project's product—a brief summary of the product description (the product description is discussed in Section 5.1.1.1).

Project deliverables—a list of the summary-level subproducts whose full and satisfactory delivery marks completion of the project. For example, the major deliverables for a software development project might include the working computer code, a user manual, and an interactive tutorial. When known, exclusions should be identified, but anything not explicitly included is implicitly excluded.

Project objectives—the quantifiable criteria that must be met for the project to be

considered successful. Project objectives must include at least cost, schedule, and quality measures. Project objectives should have an attribute (e.g., cost), a metric (e.g., United States [U.S.] dollars), and an absolute or relative value (e.g., less than 1.5 million). Unquantified objectives (e.g., “customer satisfaction”) entail high risk to successful accomplishment.

.2 Supporting detail. Supporting detail for the scope statement should be documented and organized as needed to facilitate its use by other project management processes. Supporting detail should always include documentation of all identified assumptions and constraints. The amount of additional detail may vary by application area.

.3 Scope management plan. This document describes how project scope will be managed and how scope changes will be integrated into the project. It should also include an assessment of the expected stability of the project scope (i.e., how likely is it to change, how frequently, and by how much). The scope management plan should also include a clear description of how scope changes will be identified and classified. (This is particularly difficult—and therefore absolutely essential—when the product characteristics are still being elaborated.)

A scope management plan may be formal or informal, highly detailed or broadly framed, based on the needs of the project. It is a subsidiary component of the project plan (described in Section 4.1.3.1).

1. 范围说明：范围说明在项目干系人之间确认或建立一个对项目范围的共识，作为未来项目决策的基准文档。随着项目的进展，项目范围说明可能需要根据项目范围的变更而进行修改或细化。范围说明应当包括（直接或通过参见其他文档）如下内容：

- 项目理由/论证—执行项目所要满足的商业需求, 提供评估对未来效益权衡的基础。
- 项目产品—是产品描述的简要概括。
- 项目可交付成果—各层次子产品的总和，它们各自得到完整或满意地完成，标志着项目的完成。例如：对一个软件开发项目，其主要的可交付成果可能包括计算机代码、用户手册、人机交互学习程序等。一旦明确，应该识别非可交付成果，任何没有明确要求的结果，都意味着它在项目可交付成果之外。
- 项目目标—确定项目成功完成所必须满足的定量标准。项目目标必须至少包括成本、进度和质量标准。项目目标应该有属性（如成本）、计算单位或一个绝对或相对的值。对于成功完成项目来说，没有量化的目标（如“客户满意度”通常隐含较高的风险）。

2. 详细依据：范围说明的详细依据应当根据需要适当的组织并形成文件，以使其能够被其他项目管理过程使用。详细依据应当包括所有已确定的假设和约束条件的文档。详细依据的数量在不同的领域中会有所不同。

3. 范围管理计划：范围管理计划是描述项目范围如何进行管理，项目范围怎样变化才能与项目要求相一致等问题的。它也应该包括一个对项目范围预期的稳定性而进行的评估（比如：可能发生范围变更的原因、变化频率和变更量）。范围管理计划也应该包括对范围变更怎样确定和分类（当产品特征尚未描述完善的时候，做到这一点尤其困难，但绝对必要）。

根据具体项目工作的需要，范围管理计划可以是正式的或非正式的，很详细的或粗略的，它是项目计划（在 4.1.3.1 中阐述）的一个子计划。

5.3 范围定义[SCOPE DEFINITION]

Scope definition involves subdividing the major project deliverables (as identified in the scope statement as defined in Section 5.2.3.1) into smaller, more manageable components to:

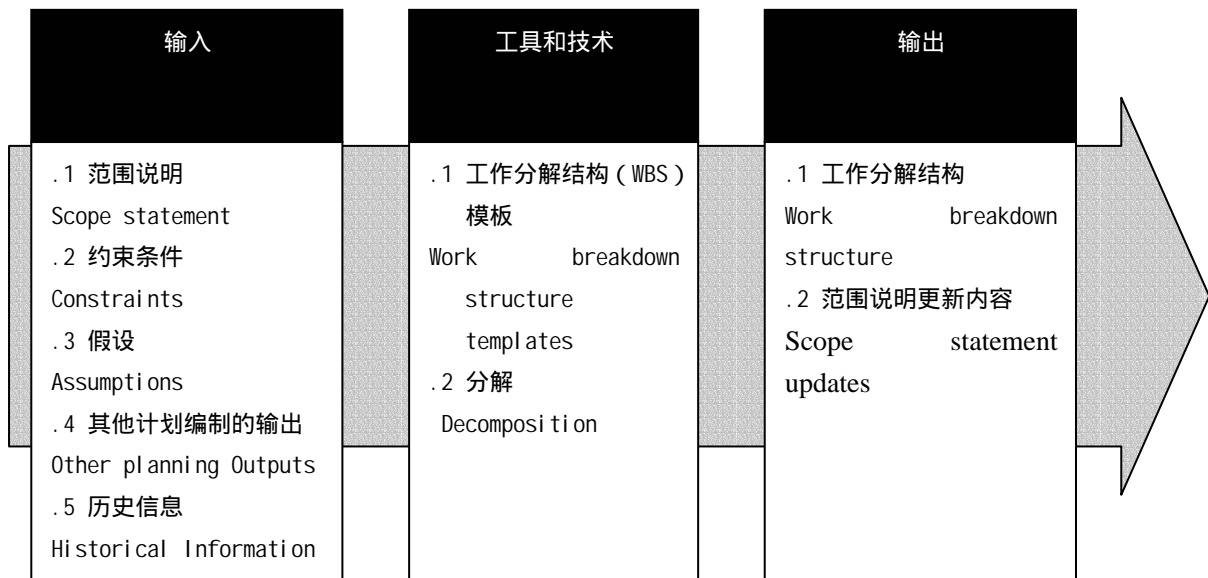
- Improve the accuracy of cost, duration, and resource estimates.
- Define a baseline for performance measurement and control.
- Facilitate clear responsibility assignments.

Proper scope definition is critical to project success. "When there is poor scope definition, final project costs can be expected to be higher because of the inevitable changes which disrupt project rhythm, cause rework, increase project time, and lower the productivity and morale of the workforce" (3).

项目范围定义是把主要的项目可交付成果（如在 5.2.3.1 节范围说明中定义的那样）分解成更小、更易管理的单元，以达到如下目的：

- 提高对于成本、时间及资源估算的准确性。
- 为绩效测量与控制定义一个基准计划。
- 便于进行明确的职责分配。

正确的范围定义是项目成功的关键。"当范围定义不明确时，由于不可避免的变更会使最终项目成本大大超出预算。因为这些不可避免的变更会破坏项目节奏，导致返工、增加项目历时、降低生产率和工作人员的士气"。



5.3.1 范围定义的输入[Inputs to Scope Definition]

.1 **Scope statement.** The scope statement is described in Section 5.2.3.1.
 .2 **Constraints.** Constraints are described in Section 5.1.3.3. When a project is done under contract, the constraints defined by contractual provisions are often important considerations during scope definition.

.3 **Assumptions.** Assumptions are described in Section 4.1.1.5.

.4 **Other planning outputs.** The outputs of the processes in other knowledge areas should be reviewed for possible impact on project scope definition.

.5 **Historical information.** Historical information about previous projects should be considered during scope definition. Information about errors and omissions on previous projects should be especially useful.

1. **范围说明：**范围说明在 5.2.3.1 节中阐述。
2. **约束条件：**约束条件的阐述在 5.1.3.3 中。当一个项目按照合同执行时，由合同条款规定的约束条件在范围定义中通常是重要的考虑因素。
3. **假设：**假设的阐述在 5.1.3.4 中。
4. **其他计划编制的输出：**应当注意其他知识领域的过程的输出对范围定义可能产生的影响。
5. **历史信息：**在项目范围定义过程中，应该考虑以前项目的有关历史信息。信息中的有关错误或失误尤其值得借鉴。

5.3.2 范围定义的工具和技术[Tools and Techniques for Scope Definition]

.1 **Work breakdown structure templates.** A WBS (described in Section 5.3.3.1) from a previous project can often be used as a template for a new project. Although each project is unique, WBSs can often be “reused” since most projects will resemble another project to some extent. For example, most projects within a given organization will have the same or similar project life cycles, and will thus have the same or similar deliverables required from each phase.

Many application areas or performing organizations have standard or semi standard WBSs that can be used as templates. For example, the U.S. Department of Defense has recommended standards WBSs for Defense Material Items (MILHDBK-881). A portion of one of these templates is shown as Figure 5-2.

.2 **Decomposition.** Decomposition involves subdividing the major project deliverables or subdeliverables into smaller, more manageable components until the deliverables are defined in sufficient detail to support development of project activities (planning, executing, controlling, and closing). Decomposition involves the following major steps:

(1) Identify the major deliverables of the project, including project management. The major deliverables should always be defined in terms of how the project will actually be organized. For example:

The phases of the project life cycle may be used as the first level of decomposition with the project deliverables repeated at the second level, as illustrated in Figure 5-3.

The organizing principle within each branch of the WBS may vary, as illustrated in Figure 5-4.

(2) Decide if adequate cost and duration estimates can be developed at this level of detail for each deliverable. The meaning of adequate may change over the course of the project—decomposition of a deliverable that will be produced far in the future may not be possible. For each deliverable, proceed to Step 4 if there is adequate detail, to Step 3 if there is not—this means that different deliverables may have differing levels of decomposition.

(3) Identify constituent components of the deliverable. Constituent components should be

described in terms of tangible, verifiable results to facilitate performance measurement. As with the major components, the constituent components should be defined in terms of how the work of the project will actually be organized and the work of the project accomplished. Tangible, verifiable results can include services as well as products (e.g., status reporting could be described as weekly status reports; for a manufactured item, constituent components might include several individual components plus final assembly). Repeat Step 2 on each constituent component.

(4) Verify the correctness of the decomposition:

Are the lower-level items both necessary and sufficient for completion of the decomposed item? If not, the constituent components must be modified (added to, deleted from, or redefined).

Is each item clearly and completely defined? If not, the descriptions must be revised or expanded.

Can each item be appropriately scheduled? Budgeted? Assigned to a specific organizational unit (e.g., department, team, or person) who will accept responsibility for satisfactory completion of the item? If not, revisions are needed to provide adequate management control.

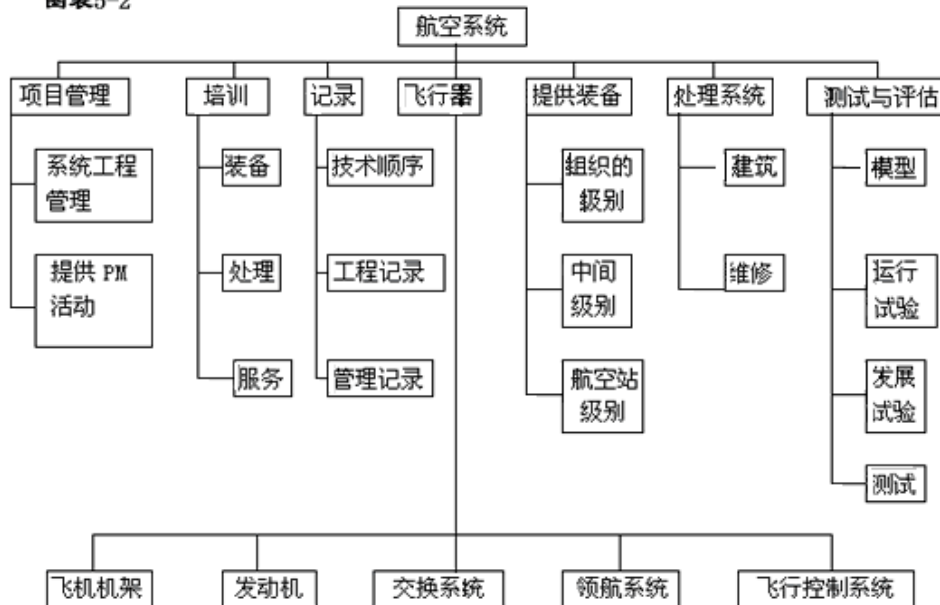
1. **工作分解结构模板**：来自以前项目中的工作分解结构 (WBS, 在 5.3.3.1 中阐述) 经常可作为一个新项目的模板。虽然每个项目是独特的, 但是多数项目间在某种程度上是具有相似性的, 所以 WBS 经常能被“重复使用”。例如: 在一个组织中, 许多项目都有相同或相似的项目生命周期, 因此对每个项目阶段可能有相同或相似的可交付成果要求。

许多应用领域或项目执行机构都有标准或半标准的 WBS, 它能当作模板用。例如: 美国国防部, 为国防装备项目定义了许多标准的 WBS。图 5-2 所示的是其中的一部分。

图 5-2 国防装备项目典型的 WBS

为美国国防材料项目的工作

图表 5-2



2. **分解**：将主要的项目可交付成果分成更小的、更易管理的单元, 直到可交付成果细分到足以用来支持未来的项目活动制定 (计划编制、执行、控制及收尾等)。分解涉及以下几个主要步骤：

(1) 确定项目的主要可交付成果, 包括项目管理。通常, 项目的主要可交付成果总是依据实际管理方式进行定义的。例如：

- 项目生命周期的各个阶段可以当作分解的第一层次, 而项目可交付成果可能作为分解的第二层

次。如图 5-3 所示。

- BS 中的各个分支中的组织原则可能会不同，用图 5-4 来说明。

图 5-3 由阶段组织的工作分解结构示例

一定的阶段组织的工作分析结构样板

图表5-3

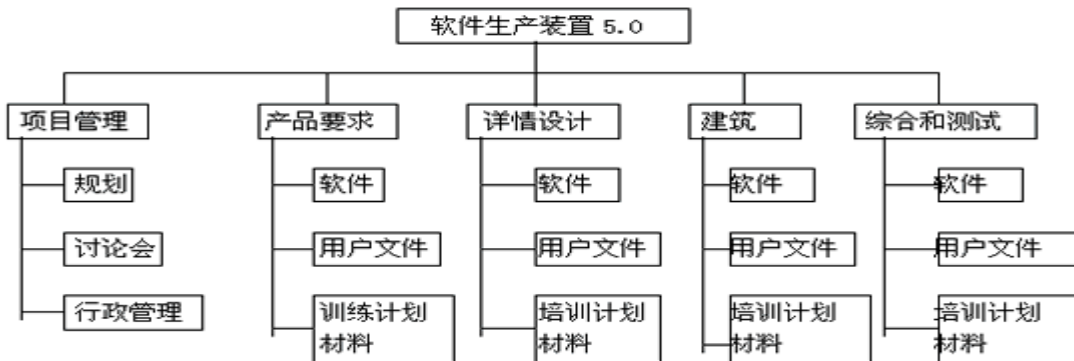
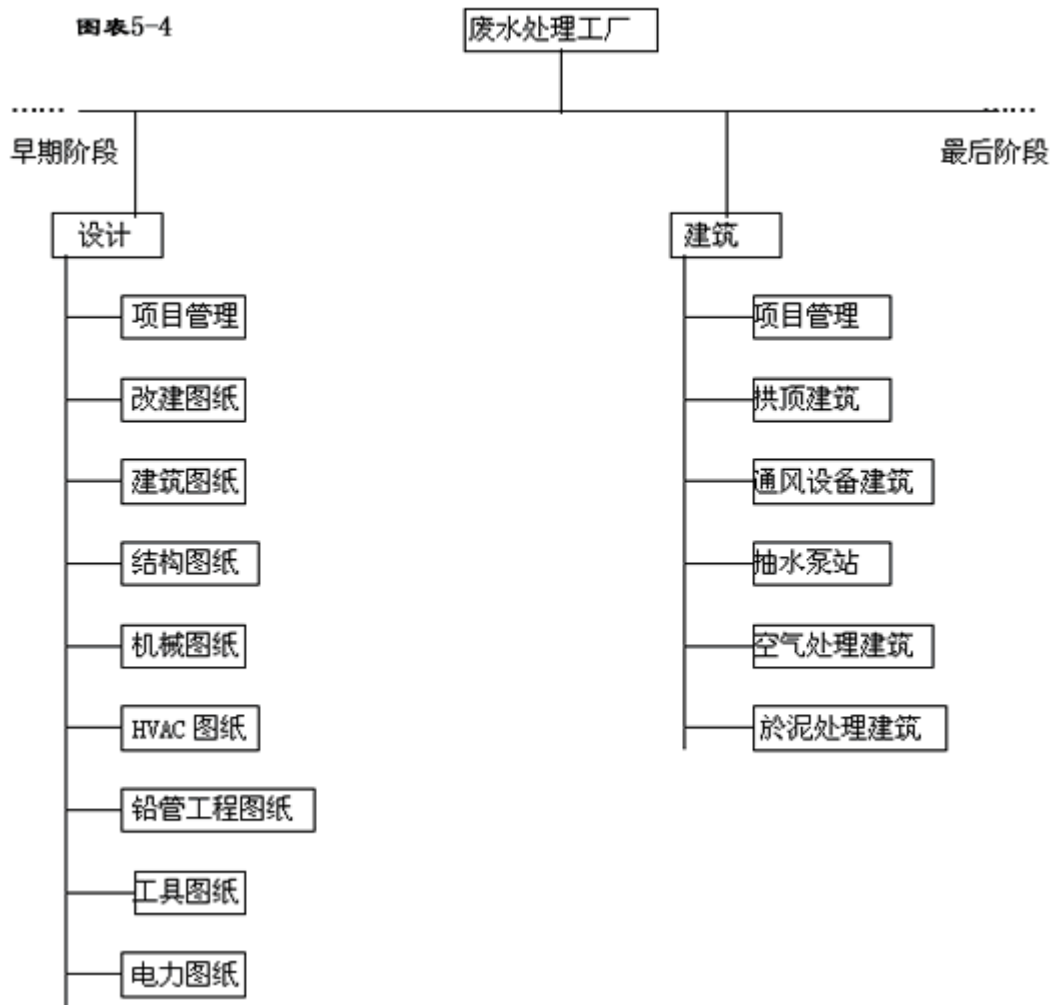


图 5-4 废水处理项目工作分解结构示例

废水处理工厂的分析结构

图表5-4



(2) 确定每个可交付成果的详细程度是否已经达到了足以编制出恰当的成本和工期估算。这里“恰当”

的含义可能随着项目的进程而变化。对在遥远的将来产生的一项可交付成果进行分解也许是不太可能的。对于每一个可交付成果，如果已足够详细就进入第（4）步，否则，进入第（3）步。这意味着不同的可交付成果有不同的分解层次。

（3）确定项目可交付成果的组成元素。组成元素应该用有形的、可验证的结果来描述，目的是为了便于绩效检测。与主要元素一样，组成元素定义的依据是项目工作实际上是如何组织和完成的。有形的、可验证的结果既包括服务，也包括产品（比如：状态报告可能描述成状态周报；对于制造项目，组成元素可能包括几个单独的部件加上最后的装配）。在每个组成元素上重复步骤（2）。

（4）核实分解的正确性：

- 下层项对分解项的完成来说是否必要并充分？如果不是，就必须修改组成元素（添加、删除或重新定义）。
- 每项的定义是否清晰完整？如果不是，就必须修改或扩展该描述。

每项能否用来编制进度和预算？能否进行人员和其他资源的分配？如果不是，需要做必要的修改，以便提供合适的管理控制。

5.3.3 范围定义中的输出[Outputs from Scope Definition]

.1 Work breakdown structure. A WBS is a deliverable-oriented grouping of project components that organizes and defines the total scope of the project; work not in the WBS is outside the scope of the project. As with the scope statement, the WBS is often used to develop or confirm a common understanding of project scope. Each descending level represents an increasingly detailed description of the project deliverables. Section 5.3.2.2 describes the most common approach for developing a WBS. A WBS is normally presented in chart form, as illustrated in Figures 5-2, 5-3, and 5-4; however, the WBS should not be confused with the method of presentation—drawing an unstructured activity list in chart form does not make it a WBS.

Each item in the WBS is generally assigned a unique identifier; these identifiers can provide a structure for a hierarchical summation of costs and resources. The items at the lowest level of the WBS may be referred to as work packages, especially in organizations that follow earned value management practices. These work packages may in turn be further decomposed in a subproject work breakdown structure. Generally, this type of approach is used when the project manager is assigning a scope of work to another organization, and this other organization must plan and manage the scope of work at a more detailed level than the project manager in the main project. These work packages may be further decomposed in the project plan and schedule, as described in Sections 5.3.2.2 and 6.1.2.1.

Work component descriptions are often collected in a WBS dictionary. A WBS dictionary will typically include work package descriptions, as well as other planning information such as schedule dates, cost budgets, and staff assignments.

The WBS should not be confused with other kinds of “breakdown” structures used to present project information. Other structures commonly used in some application areas include:

Contractual WBS (CWBS), which is used to define the level of reporting that the seller will provide the buyer. The CWBS generally includes less detail than the WBS used by the seller to manage the seller’s work.

Organizational breakdown structure (OBS), which is used to show which work components have

been assigned to which organizational units.

Resource breakdown structure (RBS), which is a variation of the OBS and is typically used when work components are assigned to individuals.

Bill of materials (BOM), which presents a hierarchical view of the physical assemblies, subassemblies, and components needed to fabricate a manufactured product.

Project breakdown structure (PBS), which is fundamentally the same as a properly done WBS. The term PBS is widely used in application areas where the term WBS is incorrectly used to refer to a BOM.

.2 **Scope statement updates.** Include any modification of the contents of the scope statement (described in Section 5.2.3.1). Appropriate stakeholders must be notified as needed.

1. 工作分解结构：工作分解结构（WBS）是面向可交付成果的项目元素的分组，它组织并定义了整个项目范围，未列入工作分解结构的工作将排除在项目范围之外。与范围说明一样，这个 WBS 通常是用来建立或确认一个达成共识的项目范围。工作分解结构每细分一个层次表示对项目可交付成果更详细的描述。在 5.3.2.2 中阐述了建立一个 WBS 的最常用的方法。WBS 通常以图表形式表示，如图 5-2、5-3 和 5-4 所示。当然，WBS 不应该与其表述方法混淆起来。以图表形式绘制一个无结构的清单并不是一个 WBS。

在 WBS 中的每一个具体项目工作通常都指定唯一的代码，这些代码可以为成本和资源的分层总汇提供一个构架。WBS 的最低层次通常被称为工作包。特别是在采用挣值管理的组织机构中。这些工作包可能在子项目工作分解结构中进一步分解。一般而言，如果项目经理把一个工作范围分包给另一个组织，这个组织必须在比主项目中更加详细的层次计划和管理这个工作范围，这种情况下常常采用上述方法。如 5.3.2.2 节和 6.1.2.1 节中阐述的，在项目计划和进度中这些工作包可以进一步分解。

具体工作元素通常收集在 WBS 词典中。工作分解结构字典一般包括工作包描述及其他计划编制信息，如进度计划日期、成本预算和人员安排等。

WBS 不应该与其他表示项目信息的“分解结构”混淆。在一些应用领域，通常会用到的其他一些结构包括：

- 合同 WBS (CWBS)，它是用于定义卖方提供给买方的报告级别。通常 CWBS 包括的内容要比 WBS 的少。
- 组织分解结构 (OBS)，它是用以显示各个工作元素分别被分配到哪个组织单元。
- 资源分解结构 (RBS)，是组织分解结构的一种变化形式，通常在将工作元素分配到个人时使用。
- 材料清单 (BOM)，表述了用于制造一个加工产品所需的实际部件、组件和构件的分级层次。
- 项目分解结构 (PBS)，它与 WBS 是基本相同的。PBS 更广泛地应用在因 WBS 不能妥善表达 BOM 内容的领域中。

2. 更新的范围说明：包括范围说明内容的任何修改（已在 5.2.3.1 节中描述）。根据需要，必须通知适当的干系人。

5.4 范围核实[SCOPE VERIFICATION]

Scope verification is the process of obtaining formal acceptance of the project scope by the stakeholders (sponsor, client, customer, etc.). It requires reviewing deliverables and work results to ensure that all were completed correctly and satisfactorily.

If the project is terminated early, the scope verification process should establish and document the level and extent of completion. Scope verification differs from quality control (described

in Section 8.3) in that it is primarily concerned with acceptance of the work results while quality control is primarily concerned with the correctness of the work results. These processes are generally performed in parallel to ensure both correctness and acceptance.

范围核实是项目干系人（发起人、客户和顾客）正式接受项目范围的过程。范围核实需要审查可交付成果和工作结果，以确保它们都已经正确圆满的完成。如果项目被提前终止，范围核实过程应当对项目完成程度建立文档。范围核实与前面讲的质量控制是不同的，范围核实是有关工作结果的“接收”，而质量控制是有关工作结果正确性。这些过程一般平行进行，以确保可接受性和正确性。



5.4.1 范围核实的输入[Inputs to Scope Verification]

.1 **Work results.** Work results—which deliverables have been fully or partially completed—are an output of project plan execution (discussed in Section 4.2).

.2 **Product documentation.** Documents produced to describe the project’s products must be available for review. The terms used to describe this documentation(plans, specifications, technical documentation, drawings, etc.) vary by application area.

.3 **Work breakdown structure.** The WBS aids in definition of the scope, and should be used to verify the work of the project (see Section 5.3.3.1).

.4 **Scope statement.** The scope statement defines the scope in some detail and should be verified (see Section 5.2.3.1).

.5 **Project plan.** The project plan is described in Section 4.1.3.1.

1. **工作结果：**工作结果是已经完成或部分完成的项目阶段性的可交付成果，它是项目计划执行的输出结果（在 4.2 中讨论）。

2. **产品文档：**必须有描述项目产品的文档供审查。用于描述这种文档(计划、规范、技术性文件和图纸等)的术语随着应用领域而变化。

3. **WBS：**有助于范围定义，应当用 WBS 确认项目的工作（见 5.3.3.1）

4. **范围说明：**范围说明在一定的详细程度上定义了范围，应当予以确认（参见 5.2.3.1）

5. 项目计划：项目计划在 4.1.3.1 节作了描述。

5.4.2 范围核实的工具和技术[Tools and Techniques for Scope Verification]

.1 **Inspection.** Inspection includes activities such as measuring, examining, and testing undertaken to determine whether results conform to requirements. Inspections are variously called reviews, product reviews, audits, and walkthroughs; in some application areas, these different terms have narrow and specific meanings.

1. **检查**：检查包括测量、测试、检验等活动以判断结果是否符合计划的要求。检查也可叫做：审查、产品审查、审计和巡回检查等。在某些应用领域，这些不同的词有它自己的使用范围和特定的含义。

5.4.3 范围核实的输出[Outputs from Scope Planning]

.1 **Formal acceptance.** Documentation that the client or sponsor has accepted the product of the project phase or major deliverable(s) must be prepared and distributed. Such acceptance may be conditional, especially at the end of a phase.

1. **正式接收**：客户或项目发起人已经接收了项目阶段产品或主要可交付成果，必须对此形成文件分发。这种接收可能是有条件的，尤其是在阶段的结束点上。

5.5 范围变更控制[SCOPE CHANGE CONTROL]

Scope change control is concerned with a) influencing the factors that create scope changes to ensure that changes are agreed upon, b) determining that a scope change has occurred, and c) managing the actual changes when and if they occur. Scope change control must be thoroughly integrated with the other control processes (schedule control, cost control, quality control, and others, as discussed in Section 4.3).

项目范围变更控制涉及的是(a)对造成范围变更的因素施加影响，以确保这些变更得到一致认可；(b)确定范围变更是否已经发生；(c)当范围变更发生时对实际变更进行管理。范围变更控制必需与其他控制管理过程（进度控制、成本控制、质量控制及其他控制在 4.3 中阐述）结合在一起用。



5.5.1 范围变更控制的输入[Inputs to Scope Change Control]

.1 **Work breakdown structure.** The WBS is described in Section 5.3.3.1. It defines the project's scope baseline.

.2 **Performance reports.** Performance reports, discussed in Section 10.3.3.1, provide information on scope performance, such as which interim deliverables have been completed and which have not. Performance reports may also alert the project team to issues that may cause problems in the future.

.3 **Change requests.** Change requests may occur in many forms—oral or written, direct or indirect, externally or internally initiated, and legally mandated or optional. Changes may require expanding the scope or may allow shrinking it.

Most change requests are the result of:

An external event (e.g., a change in a government regulation).

An error or omission in defining the scope of the product (e.g., failure to include a required feature in the design of a telecommunications system).

An error or omission in defining the scope of the project (e.g., using a BOM instead of a WBS).

A value-adding change (e.g., an environmental remediation project is able to reduce costs by taking advantage of technology that was not available when the scope was originally defined).

Implementing a contingency plan or workaround plan to respond to a risk, as described in Section 11.6.3.3.

.4 **Scope management plan.** The scope management plan is described in Section 5.2.3.3.

1. **WBS :** WBS 在 5.3.3.1 中进行了阐述，它确定了项目范围的基准计划。

2. **绩效报告 :** 绩效报告在 10.3.3.1 中阐述。提供一个项目范围绩效的信息，如哪些中间产品已经完成或没有完成。绩效报告也能提醒项目团队可能会在未来引起问题的事项。

3. **变更申请 :** 变更申请可以采取很多形式--口头的或书面的、直接的或间接的、内部的或外部的，强制性的或选择性的。变更可能需要扩大或缩小项目范围。多数变更申请都是有下列情况导致的：

- 一个外部事件（如：政府规定的变更）。

- 产品范围的定义有过失或疏漏（比如：一个远程通信系统在设计时忽略了一个需要的特性）。
- 项目范围的定义有过失或疏漏（比如：用材料清单代替了工作分解结构）
- 一个增值的变更（比如：一个环境保护项目能够通过使用项目最初定义范围时还没有的先进技术降低成本）。

4. **范围管理计划**：范围管理计划在 5.2.3.3 中阐述。

5.5.2 范围变更控制的工具和技术[Tools and Techniques for Scope Change Control]

.1 **Scope change control**. A scope change control defines the procedures by which the project scope may be changed. It includes the paperwork, tracking systems, and approval levels necessary for authorizing changes. The scope change control should be integrated with the integrated change control described in Section 4.3 and, in particular, with any system or systems in place to control product scope.

When the project is done under contract, the scope change control must also comply with all relevant contractual provisions.

.2 **Performance measurement**. Performance measurement techniques, described in Section 10.3.2, help to assess the magnitude of any variations that do occur. Determining what is causing the variance relative to the baseline and deciding if the variance requires corrective action are important parts of scope change control.

.3 **Additional planning**. Few projects run exactly according to plan. Prospective scope changes may require modifications to the WBS or analysis of alternative approaches (see Sections 5.3.3.1 and 5.2.2.3, respectively).

1. **范围变更控制系统**：范围变更控制系统定义项目范围变更的有关程序。它包括文档工作、跟踪系统及对于授权变更所需要的批准层次等。范围变更控制系统应当与综合变更控制系统（在 4.3 中论述）结合在一起使用，尤其要与控制产品范围的一个或多个系统协调起来。当项目按照合同执行时，范围变更控制必须按所有相关的合同规定执行。

2. **绩效测量**：绩效测量技术在 10.3.2 中阐述，绩效测量技术能帮助人们评估所发生偏差的程度。范围变更控制的一个重要部分是分析导致变更的原因是什么，并决定对这种偏差是否需要采取纠正措施。

3. **补充计划编制**：很少有项目能按计划的要求精确地进行。预期的范围变更可能要求对 WBS 进行修改或对其他的替代方法进行分析。（分别参见 5.3.3.1 节和 5.2.2.3 节）

5.5.3 范围变更控制的输出[Outputs from Scope Change Control]

.1 **Scope changes**. A scope change is any modification to the agreed-upon project scope as defined by the approved WBS. Scope changes often require adjustments to cost, time, quality, or other project objectives.

Project scope changes are fed back through the planning process, technical and planning documents are updated as needed, and stakeholders are notified as appropriate.

.2 **Corrective action**. Corrective action is anything done to bring expected future project performance in line with the project plan.

.3 **Lessons learned**. The causes of variances, the reasoning behind the corrective action chosen,

and other types of lessons learned from scope change control should be documented, so that this information becomes part of the historical database for both this project and other projects of the performing organization.

.4 **Adjusted baseline.** Depending upon the nature of the change, the corresponding baseline document may be revised and reissued to reflect the approved change and form the new baseline for future changes.

1. **范围变更**：范围变更是对已批准的 WBS 所确认的项目范围的所有修改。范围变更经常要求对成本、时间、质量和其他项目目标进行调整。范围变更应反馈到计划编制过程，技术或计划编制的文档应根据需要进行更新，并将更新的内容通知有关项目干系人。

2. **纠正措施**：纠正措施是使预期的项目绩效与项目计划保持一致所作的任何事情。

3. **教训**。我们应该把各种变更的原因、选择纠正措施的理由以及从范围变更控制中得出的其他形式的经验教训，当作文件记录下来，使之变成历史数据库的一部分，为项目执行组织执行这个项目和其他项目提供参考。

4. **调整后的基准计划**：根据变更的性质，相应的基准文档要重新进行修改和发布，以反映已批准的变更并作为未来变更的新基准。