

VALUE STANDARD
and
BODY OF KNOWLEDGE

價值標準與知識體系

中華價值管理會

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The SAVE International Standard's Body of Knowledge will continue to be expanded to include information on the various tools and techniques used in the practice of Value

國際價值協會 (SAVE International, 以下簡稱 SAVE) 的知識體系將持續擴大至包含執行價值所需應用的不同工具與技巧的資訊。

Acknowledgements

1. 致謝

SAVE International gratefully acknowledges the VP Education team and, in particular, Fred Kolano, (SAVE International Director of Standards and Resources), Randall Sprague, and Dr. Roy Woodhead for their contributions and additions to the original standard developed by the Paul Revere Chapter and John W. Bryant in May, 1997.

國際價值協會 (SAVE International，以下簡稱 SAVE) 由衷感謝教育副理事長之小組，特別是標準與資源部主任 Fred Kolano 先生、Randall Sprague 和 Roy Woodhead 博士等人的貢獻、以及對 Paul Revere 分會和 John W. Bryant 在 1997 年 5 月所發展原始標準的增補。

中華價值管理學會 (以下簡稱學會或 VMIT) 將適時翻譯最新版本，本版是 SAVE 在 2007 年 6 月公佈的版本，經由授證委員會多位委員的努力翻譯、討論與整合，再送請授證委員會所有委員，以及學會全體會員提供意見而成。感謝所有提供意見的專家與會員，讓本標準能更符合大家的期望。

Foreword

2. 前言

This Standard was originally drafted in May 1997. It has been updated periodically to address changes in the business environment and technology and to meet future integration with the International Standards Organization. The Value Standard is intended to provide a practical guide for applying the principles of the value methodology in a consistent manner. It may be used by both practitioners and management.

本標準最初由國際價值協會在 1997 年 5 月所草擬，並定期更新以因應經營環境及技術上的變化，符合未來國際標準組織整合之用。本價值標準希望提供使用者及管理階層一本實用手冊，採行一致的方式應用價值方法論(VM)原理。

The value methodology can be applied to a wide variety of applications, including industrial or consumer products, construction projects, manufacturing processes, business procedures, services, and business plans.

價值方法論可廣泛的應用在各行各業，包括工業或消費性產品、營建專案、製造流程、業務流程、服務業和經營計畫等。

The value methodology is commonly applied under the names Value Analysis (VA), Value Engineering (VE), and Value Management (VM). These terms can be used interchangeably with value methodology throughout the standard and this document. Other value improvement processes also qualify as value studies as long as they adhere to the Value Standard's Job Plan and perform Function Analysis as part of their total process.

價值方法論常用的名稱為價值分析(VA)、價值工程(VE)和價值管理(VM)，這些用語將被交互使用於價值方法論之標準及本文中。而其他價值改善程序，只要遵守價值標準

之工作計畫，並且於整體程序中執行機能分析，即可被稱為價值研析。

This Standard has been prepared by the SAVE International Standards and Resources Director, a member of the SAVE International's Vice President of Education's team. It is approved by the SAVE International Certification Board and the SAVE International Board of Directors. It seeks to state the minimum that clients and providers should expect when the value methodology is applied to a project.

本標準由 SAVE 標準與資源部主任(SAVE 副理事教育團隊成員之一)提出，經 SAVE 授證委員會和 SAVE 理事會核定。期望在專案計畫中使用價值方法論時，能滿足客戶和提供者的基本期望。

中文版價值方法論標準由學會授證委員會完成，並經理事會核備。

This Standard will assist managers, value program managers, practitioners, and trainers in applying value methodology in their organizations in a consistent, standard manner. It may also assist those who procure value methodology services to develop proposal requests that ensure they receive complete and useful value methodology services.

本標準將協助管理者、價值計畫經理、價值實踐者、教育訓練講師等，於其組織內應用價值方法論時，提供一套一致性的標準方法。同時也可協助採購人員，發展服務建議需求，以確保能獲得完整、有用的價值方法論服務。

The nomenclature used throughout this Value Standard and Body of Knowledge is as follows:

在價值標準和知識體系中的專有名詞如下:

Value Study -- The overarching objective of a value study is to improve the value of the project.

價值研析-- 價值研析的主要目標是增進專案的價值。

Job Plan – Provides the structure for the Value Study which is part of a three-stage process (see Figure 1)

1. Pre-Workshop preparation
2. Value Workshop which applies the Six Phase Job Plan
3. Post-Workshop documentation and implementation

工作計畫- 提供價值研析三階段程式的架構（參見圖 1）

- 1.研析前置作業。
- 2.價值研析作業，應用六階段的工作計畫。
- 3.研析後續作業，文件紀錄和實施。

Value Methodology – Provides the process and structure that is used to apply the Value Job Plan used in the Workshop.

價值方法論-提供於研析作業（Workshop）中，應用工作計畫之程序及架構。

Value Standard – Establishes the specific six-phase sequential Job Plan process and outlines the objectives of each of those phases. It does not standardize the specific activities that are used to accomplish each phase.

價值標準-建立明確的六階段連續性工作計畫（Job Plan）程序，並概述每一階段之目的。它並不標準化完成各階段之特定作業（Activity）。

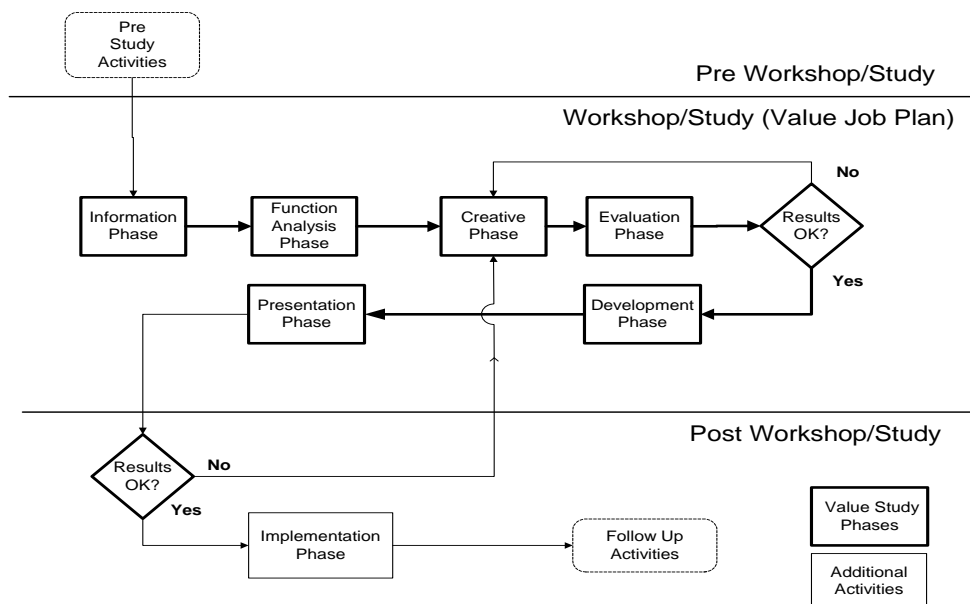


Figure 1. Value Study Process Flow Diagram

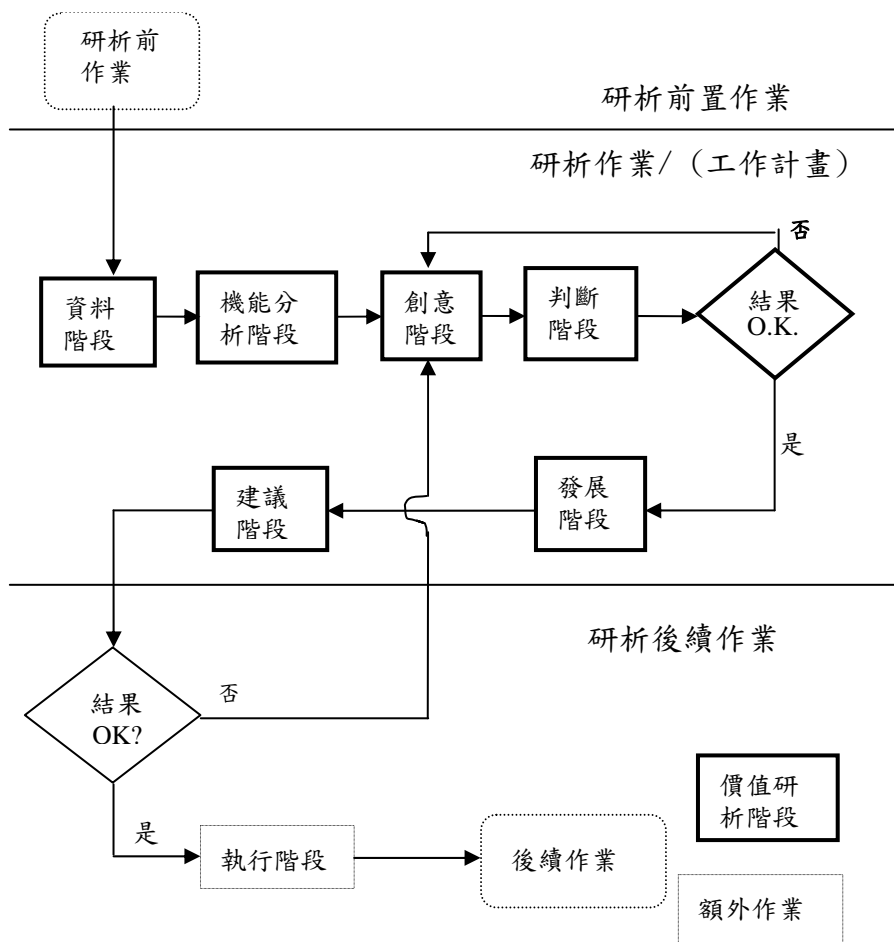


圖 1. 價值研析程序流程圖

Value Standard

3. 價值標準

Purpose and Scope of the Standard

3.1. 標準的目的和範疇

The purpose of this document is to:

1. Define the steps and components that constitute a valid Value Study.
2. Document supporting information that defines a generic methodology, common terminology, and standard practice to guide practitioners and managers in effectively applying value methodology to improve the value of their projects.
3. Guide the practitioner and manager in determining at what point to apply value methodology to a project in order to maximize:
 - a. the benefits of team innovation skills and
 - b. implementation of alternative(s) that add value to the project.

本檔目的如下：

1. 定義構成一個有效的價值研析步驟和要素。
2. 定義方法論、共同的術語和操作標準，以引導實踐者和管理者，能有效地應用價值方法論，改進專案價值。
3. 指引實踐者和管理者確定價值方法論應用於專案之時機，使下列成果最佳化：
 - a. 因團隊創新技能而產生的利益；和

b. 增加專案價值的替代方案。

This document may be used by both practitioners and managers as a guide for applying value methodology.

本文件可作為實踐者和管理者應用價值方法論之指南。

The Value Standard allows for the tailored application of value methodology and related practices to suit the intended application.

價值標準允許價值方法論和相關實務的修改，以適合各種不同的應用。

The Value Standard has not been prepared as a legal document. If the user intends to use the Value Standard for procurement purposes the user should consult expertise familiar with contract language, including seeking legal guidance.

價值標準並非法律檔。若使用者打算以價值標準作為採購目的，應先諮詢熟知合約語彙專家，包括尋找法律指導等。

Users of the Value Standard should be aware that some governing bodies require that value engineering facilitator hold specific licenses or other credentials not identified by the Value Standard. If so, the user should identify such considerations when soliciting and contracting for value methodology services.

價值標準之使用者應瞭解，某些機構要求價值工程執行者擁有特定證照，或其他非價值標準認定之資格。在此情況之下，使用者在價值方法論服務之邀標及簽約時，應確認此考量。

A Value Study is the formal application of a value methodology to a project in order to improve its value. This application is also referred to as value engineering, value analysis, value planning, or value management. For purposes of this standard, the subject of a Value Study whether it is a product, process, procedure, design, or service will be referred to as the “project.”

價值研析是實際應用價值方法論於專案中，以提昇其價值，這個應用也被稱為價值工程、價值分析、價值規劃或價值管理。為符合本標準的設置目的，價值研析的主題不論是產品、程序、程式、設計或服務，都統稱為「專案」。

The Value Standard

3.2. 價值標準

The value methodology is a systematic process that follows the Job Plan. A value methodology is applied by a multidisciplinary team to improve the value of a project through the analysis of functions.

價值方法論是一種依循工作計畫的系統化程序，由各種專業組成之小組，應用價值方法論，經由機能分析，提昇研析專案的價值。

The Job Plan consists of the following sequential phases. (See Figure 1)

工作計畫包括以下順序性階段。(參見圖 1)

1. Information Phase

The team reviews and defines the current conditions of the project and identifies the goals of the study.

1. 資料階段

研析小組審視和定義專案的當前情況，並確認研析目標。

2. Function Analysis Phase

The team defines the project functions using a two-word active verb/ measurable noun context. The team reviews and analyzes these functions to determine which need improvement, elimination, or creation to meet the project's goals.

2. 機能分析階段

研析小組使用兩個字，以主動動詞和可數名詞（active verb/ measurable noun）來定義專案的機能，審視和分析這些機能，確定哪些需要改善、排除或創新，以符合專案的目標。

3. Creative Phase

The team employs creative techniques to identify other ways to perform the project's function(s).

3. 創意階段

研析小組應用創意技巧，以辨認執行專案機能的其他方法。

4. Evaluation Phase

The team follows a structured evaluation process to select those ideas that offer the potential for value improvement while delivering the project's function(s) and considering performance requirements and resource limits.

4. 判斷階段

研析小組依循一個結構性的判斷程式，經由陳述專案機能、考量性能要求和資源限制，來選擇具有價值改善潛力的創意構想。

5. Development Phase

The team develops the selected ideas into alternatives (or proposals) with a sufficient level of documentation to allow decision makers to determine if the alternative should be implemented.

5. 發展階段

研析小組將選擇的創意構想，發展成為一定程度的替代方案(或建議)檔，讓決策者決定替代方案是否實施。

6. Presentation Phase

The team leader develops a report and/or presentation that documents and conveys the adequacy of the alternative(s) developed by the team and the associated value improvement opportunity.

6. 建議階段

小組領隊提出一份報告/或簡報，適當的表達由研析小組完成的替代方案，以爭取價值改善的機會。

In order to qualify as a Value Study, the following conditions must be satisfied.

為了確保價值研析品質，必須滿足以下條件:

A. The Value Study Team follows an organized Job Plan that includes, at a minimum, the six phases identified in this standard. Function Analysis, as defined in this document, is performed on the project.

A.價值研析小組所依循的工作計畫，最少必須包括本標準所定義的六個階段。本檔所定義之機能分析，必須在專案中落實執行。

B. The Value Study Team is a **multidisciplinary group** of experienced professionals and project stakeholders. Team members are chosen based on their expertise and experience with the project. Sometimes individuals who have relevant expertise; but are not directly involved with the project are added to provide a different point of view.

B.價值研析小組是由不同領域專家和專案利害關係人所組成，在選擇小組成員時，是根據其專長和經驗而決定。有時選擇非直接參與專案的專業人士，以增加不同角度的觀點。

C. The Value Team Leader is trained in value methodology techniques and is qualified to lead a study team using the Job Plan. The SAVE International Certification Board certifies, with the designation Certified Value Specialists (CVS), those individuals who have met specified training requirements and have demonstrated competency in the application of the Job Plan. The Team Facilitator shall be a CVS, or a VMP serving under the guidance of a CVS as defined by SAVE Certification criteria, or shall be the holder of other active certification recognized by SAVE International.

C.價值小組領隊需曾經接受價值方法論的技術訓練，並能帶領一個使用工作計畫的研析小組。SAVE International 授證委員會認為，需指定價值專家(CVS)為價值小組領隊，其符合工作計畫應用上的訓練要求，並具有操作能力。而小組協調人可以是 CVS 或是 VMP 或持有其他由 SAVE International 認可的證照者，在 CVS 指導下執行相關工作。

Body of Knowledge

4. 知識體系

The information contained in this Body of Knowledge is a general guideline and is not meant to be either fully inclusive or exclusive of all possible techniques. Differences in the application of techniques used to accomplish VE Phases will be based on the nature of the project and the preference of the value practitioner.

知識體系所提供的資訊是一種通則，並不意謂其已包含或排除所有可能技術。在辦理價值研析時，將根據專案的本質和價值實踐者的偏好，有技術應用上的差異。

History of the Value Methodologies

4.1. 價值方法論的歷史

Value Analysis was conceived in the early 1940s by Lawrence D. Miles while he was employed by General Electric, a major defense contractor which was facing the scarcity of strategic materials needed to produce their products during World War II. Mr. Miles realized that if value and related innovation improvements could be systematically “managed,” then General Electric would have a competitive advantage in the marketplace. With that in mind, Mr. Miles accepted the challenge and devised the function analysis

concept, which he integrated into an innovative process he later termed value analysis.

價值分析是在 1940 年代初期由 Lawrence D. Miles 所提出，當時他任職於通用電器公司（General Electric），該公司為一主要國防承包商，面對第二次世界大戰期間戰略物資缺乏，仍必須生產他們的產品。Miles 意識到如果價值和相關創新改善能有系統管理，通用電氣公司將會在市場上具有競爭優勢。依據這個想法，Miles 接受挑戰，構思機能分析概念，並發展成一個創新程序，之後他命名為價值分析。

Mr. Miles understood that products are purchased for what they can do—either through the work they perform or the pleasing aesthetic qualities they provide. Using this as his foundational information, he focused on understanding the function of the component being manufactured. He questioned whether the design could be improved or if a different material or concept could achieve the function.

Miles 瞭解產品被購買的原因，是基於它們能做什麼，包括產品所能完成的工作或提供的美感。應用這個觀念作為基本原理，他專注於瞭解製作元件中的機能，思考是否使用不同材料或概念能改進設計以達到此機能？

To focus on the function itself, he used an active verb and a measurable noun in combination to characterize the benefit that a part's function provides. He then searched for other ways or methods to achieve the benefit of that intended function. From this research, function analysis, the key foundation of value methodologies, was developed and has become a tool to help individuals and teams manage the way a concept is understood.

為將焦點集中於機能本身，他使用一個主動動詞加一個可數名詞的組合，描繪零組件的特色機能。接著他尋找其他方式或方法以達成所期望的機能。從這研究開始，價值方法論的關鍵基礎--「機能分析」，便漸漸發展成為一項工具，協助個人和團隊處理對研析概念的瞭解。

These specialized teams typically address project-related issues such as increased sales revenue, improved product performance, and reduced resource usage.

這些專業團隊一般會提出與專案相關問題，譬如增加銷售收入、改善產品性能和減少資源使用等。

The U.S. Army and Navy, and other companies, soon realized the success of Larry Miles' methods. As the application of value analysis expanded, there was also a change in context—from review of existing parts to improving conceptual designs. This was one of

two factors that marked the emergence of value engineering. The other was a desire by the U.S. Navy to use the Value Analysis techniques for project improvement in the early 1950s when there was a moratorium on hiring “analysts.” Since engineering positions were available, individuals practicing this new discipline were employed as “Value Engineers.”

美國陸軍、海軍和其他公司很快便瞭解了使 Miles 成功的方法，並擴展價值分析的應用範圍，從檢視現有零件機能，延伸至改進概念設計。這就是「價值工程」誕生的二個原因之一；另一個原因是在 1950 年代初期，美國海軍希望應用價值分析技術以改善專案，因為當時暫停僱用「分析員」，卻可以工程職缺為名晉用，於是應用新價值分析技術的工作人員就以「價值工程師」的名義聘用。

As the value methodology gained in popularity, a group of practitioners formed a learning society to share insights and advance their innovative capabilities. Thus, in 1959, the “Society of American Value Engineers” was incorporated in Washington, DC.

當價值方法論逐漸普及之際，獲得一群實踐者的支持，並成立一個學習型的協會，以分享新知和促進創新能力，因此在 1959 年於華盛頓特區成立「美國價值工程師協會」。

Soon, the value methodology was used to improve the value of projects in government, the private sector, and the manufacturing the construction industries and value concepts spread worldwide.

很快地，價值方法論被應用於政府機構、私人部門、製造業、和營建業等，藉以提昇各專案價值，價值概念於是傳播到全世界。

Concurrent with this growth, a number of other value improving tools, techniques, and processes emerged, many of which were complementary to and were integrated with the value concepts. In an effort to attract the developers and practitioners of these emerging methods to our membership, the name of the society was changed to “SAVE International” in 1996.

價值方法論成長的同時，許多的其他價值改進工具、技術和程序紛紛出現，其中許多是互補的，因而結合成為新的價值概念。為努力吸引這些新興方法的開發者和實踐者為成員，1996 年美國價值工程師協會改名為國際價值協會（SAVE International）。

Overview

4.2. 緒論

The value methodology is a systematic process used by a multidisciplinary team to improve the value of a project through the analysis of its functions. Value is defined as a fair return or equivalent in goods, services, or money for something exchanged. Value is commonly represented by the relationship:

$$\text{Value} \doteq \text{Function} / \text{Resources}$$

價值方法論係一個有系統的程序，由一群不同領域的專業團隊，透過使用機能分析，改善專案價值。價值被定義成針對物件、服務、金錢作為交換之公平回報或等值的結果，價值通常由以下這關係式來表示：

$$\text{價值} \doteq \text{機能} / \text{資源}$$

Where function is measured by the performance requirements of the customer and resources are measured in materials, labor, price, time, etc. required to accomplish that function. A value methodology focuses on improving value by identifying alternate ways to reliably accomplish a function that meets the performance expectations of the customer.

機能係以客戶的性能需求衡量，資源則以達成機能所需要支付的材料、勞力、價格、時間等衡量。價值方法論的重點，在於經由提出確實可符合客戶期望機能的替代方案，改善價值。

Function Analysis is the foundation of a value methodology and is the key activity that differentiates this body of knowledge from other problem-solving or improvement practices. During the Function Analysis Phase of the Job Plan, functions are identified that describe the work being performed within the scope of the project under study. These functions are described using two word, active verb/measurable noun pairings, for example one function of a hammer is to apply force. The team reviews the project's functions to determine those

that could be improved. These may be project functions that seem to be performed inefficiently or with more than expected cost. These functions become the focus of the value methodology team in their endeavor to improve the project.

本知識體系與其他解決或改善問題方法，最大不同點在於，以機能分析為價值方法論的基礎和關鍵作業。在工作計畫的機能分析階段，機能在研析範疇內描述其應達成之性能。機能以「主動動詞+可數名詞」二個字來描述，例如鐵錘的機能是應用力量。研析團隊審視專案的機能，以確定那些能改善、那些可能運作無效率、或花費比預期更多的成本，這些機能將成為價值研析團隊努力改進專案的焦點。

The identification and naming of project functions enables clear thinking by limiting the description of a function to an active verb that operates on a measurable noun to communicate what work an item or activity performs. This naming process helps multidisciplinary teams build a shared understanding of the functional requirements of the project and, as a result, it allows them to identify where opportunities for value improvement exist in the project.

專案機能的確認和命名，限用「一個主動動詞+一個可數的名詞」來描述組件或作業所要執行的工作，使對機能的思考能更清晰。這個過程能協助不同領域的團隊，分享各自對專案所需機能的理解，並能辨識改善專案價值的機會在哪裡。

Function analysis can be enhanced through the use of a graphical mapping tool known as the Function Analysis System Technique (FAST), which allows team members to understand how the functions of a project relate to each other.

機能分析可透過一個圖形化的工具-系統化機能分析技術(FAST) 的使用而強化，FAST 可使團隊成員瞭解專案機能間之關聯性。

A fundamental tenet of a value methodology is that basic functions (the necessary purpose of the project) must be preserved. This is because the basic function reveals the usefulness of the project and the reason for its existence. For example, the basic function of a wristwatch could be “indicate time.” Other secondary functions support the basic function. These secondary functions typically provide esteem, dependability, or convenience value for the user. An example is a gold watchcase that performs an aesthetic function which pleases both customers and those whom they want to impress.

價值方法論的根本原則是主要機能(專案必要目的)必須被保存，這是因為主要機能顯示專案用途和它存在的原因，例如手錶的主要機能是「顯示時間」。其他次要機能則

支援主要機能，這些次要機能為使用者提供尊重、可靠性或便利性的價值，例如一個金錶殼能對顧客，和那些顧客想要炫耀的人，展現其美感價值。

The value methodology is applied using a process known as the “Job Plan.” The purpose of the Job Plan is to guide the Study team through the process of identifying and focusing on key project functions in order to create new ideas that will result in value improvements.

價值方法論依以「工作計畫」為名的程序進行操作，工作計畫的目的，是經由辨識和專注於專案關鍵機能的程序，引導研析小組創造出增進價值的新構想。

While a Value Study is guided by the function-based Job Plan, it can be further supported by many commonly used business improvement techniques (See Activities section for examples).

當價值研析係以機能為基礎的工作計畫所引導時，它將比許多常使用於改善企業的技术，獲得更多的支持。

Applicability

4.3. 適用性

Value methodologies can be applied during any stage of a project's development cycle, although the greatest benefit and resource savings are typically achieved early in development during the conceptual stages. At this point, the basic information of the project is established, but major design and development resources have not yet been committed. The reason this is the best time to apply a value methodology is because the manner in which the basic function of the project is performed has not been established, and alternative ways may be identified and considered.

價值方法論可應用在專案發展週期任一階段，然而提早在概念階段使用，通常能獲得最大的效益和資源的節省。此時專案的基本資料雖已建立，但主要設計和未來發展所需要的資源尚未確認。正因為執行專案主要機能的方式尚未建立，故可考慮很多替代方案，所以這就是應用價值方法論的最佳時機。

Examples of these applications are:

應用例子如下：

- Construction projects could benefit by identifying improvements for various project phases: concept development, preliminary design, final design, procurement and construction.
- 營建專案各階段的改善：概念發展、初步設計、細部設計、採購和施工等各階段。
- Manufactured products, whether consumer, industrial, or defense, may be studied with a focus on either the design or manufacturing process of that product. A product may be the subject of a value study at any time during the product's life. A value study can be applied at the onset of the product development to better understand the customer's needs, identify the functions necessary to satisfy those needs, and develop the initial

concept. Throughout the design development, value methodology can be used to refine and enhance the concept, based on the latest facts. Even after a product has been introduced and is in production, a Value Study can be used to further enhance the product and respond to changing customer and economic conditions.

A value methodology can be used to either develop new ways to manufacture a product or change an existing process.

- 工業製品，無論是消費品、工業用品或國防用品，都可聚焦於產品的設計或製程進行研析。在產品生命週期的任何時間，都可以執行價值研析。價值研析應用在產品開發時，可更進一步瞭解客戶需求，辨認必要機能以滿足客戶需求和發展初步概念。在設計發展過程中，根據最新狀況，價值方法論可用於精煉和加強概念，甚至在產品已經上市和在生產中，價值研析也可進一步精進產品以及反應顧客與經濟情況的改變。

價值方法論可使用於開發新的產品製造方法，或改變現有的製程。

- Business systems and processes may also be the subject of Value Studies. Many elements of a business or an organization may be improved through the application of a value methodology. This may be from the development of business plans and organizational studies to improving existing business processes.
- 業務系統和流程也是價值研析的主題，透過價值方法論的應用，許多業務或組織的組成單元可加以改進，或經由發展經營計畫和組織研究，來改進現有的業務流程。
- Service organizations can benefit from the use of value methodologies. In the past value methodologies have been used to improve processes and procedures in the medical industry (operating rooms, emergency rooms, etc.) and the legal system (police systems).
- 服務性組織能從應用價值方法論受益，價值方法論曾使用於醫療產業，以改進程式和步驟(開刀房、急診室等)，也曾應用於法務系統(警政系統)。

Value methodologies may be applied more than once during the life of the project. Early application of a value methodology helps to get the project started in the right direction, and repeated applications help to refine the project's direction based on new or changing information. The later a Value Study is conducted in project development, more likely implementation costs will increase.

在專案的生命週期間，價值方法論也許被應用超過一次。在專案發展的較早期階段，應用價值方法論將協助專案朝往正確的方向發展。在各階段重覆應用價值方法，將可使專案根據新的或調整後的資訊，調整發展方向。在專案發展較晚期階段導入價值研析，有可能增加執行的成本。

A value methodology may be applied as a quick response study to address a problem or as an integral part of an overall organizational effort to stimulate innovation and improve performance characteristics. Value methodologies may be used to enhance an organization's quality programs, new product development activities, manufacturing processes, and architectural and engineering design.

價值方法論也可被應用為處理問題時的一種快速回應，或當需要刺激創新和改進性能時，此法亦可成為整個組織化作業程式中的主要部分。價值方法論也被應用於提升組織品質的計畫、新產品開發、製程改善、建築與工程設計等。

Study Duration

4.4. 研析期間

A value study generally encompasses three stages. (See Figure 1, page 7)

1. Pre-Workshop (Preparation)
2. Workshop (Execution of the six phase Job Plan)
3. Post-Workshop (Documentation and Implementation)

價值研析一般包含三個階段(參見圖 1, 第 7 頁)

1. 研析前置作業(準備)。
2. 研析作業(執行六個階段的工作計畫)。
3. 研析後續作業(文件和實施)。

The duration for executing the Job Plan in a value study depends on several factors: the size and complexity of the project, the stage of project development, the estimated cost of the project, etc.

價值研析執行工作計畫期間的長短，取決於幾個因素：專案大小和複雜性、屬於計畫發展的哪一階段、專案的成本估算等。

A typical duration for the Workshop Stage is five-days, which does not include the Pre-Workshop and Post-Workshop efforts.

標準的研析作業期間為五天，不包括研析前置作業和研析後續作業。

Projects with a concise scope or a low level of complexity may be performed in less time. Sufficient time should be allotted to adequately apply the value methodology process and document the team's findings. Shortening the time needed to execute the Job Plan phases may result in a less-than-optimal result.

研析範疇簡要、或複雜性低的專案，可使用較少的時間執行研析。執行研析理應安排

充足的時間，適切地使用價值方法論程式，並紀錄團隊的研析成果。若任意縮短執行工作計畫各階段的時間，將可能導致一個比較不理想的結果。

Projects of very large scope or complexity may require 10-15 days or more to achieve the study's objectives. Consideration of these factors is important to ensure that the proper time is allocated and needs to be addressed as part of the upfront planning for a value study.

若研析範疇非常大、或複雜性高的專案，也許需要 10-15 天或更多時間來完成研析。研析前充分考慮這些因素是很重要的，如此方能安排適當的時間進行價值研析。

Job Plan Techniques

4.5. 工作計畫技巧

The value methodology is a structured, disciplined procedure aimed at improving value. That procedure is called the Job Plan. The Job Plan outlines sequential phases to be followed which support team synergy within a structured process, as opposed to a collection of individual opinions. The activities conducted during each phase of the Job Plan will stimulate the team to identify ideas and develop them into alternatives to the original concept or design.

價值方法論是一種結構性且有系統的程序，以提升價值為目標，這個程序稱為工作計畫。工作計畫依循數個連續性的階段，支援團隊在結構性程序中進行合作，並得以收集各人不同的觀點。在工作計畫各階段，將激發團隊發現創意，並發展替代方案。

The team and the project stakeholders should identify and understand the project's basic and secondary functions. Basic functions must be maintained, otherwise the intended study goals will not be accomplished.

團隊和專案利害關係人應該辨認、瞭解專案的主要和次要機能。主要機能必須被維持，否則預期的研析目標將無法達成。

Secondary functions are analyzed and evaluated with regard to their contributions to the project objectives. By making functionality explicit (via function analysis and FAST), organizations can manage innovation to provide a sustainable competitive advantage that leads to success.

次要機能要被分析和評估，確認他們對專案目標的貢獻度。藉由確認機能(透過機能分析和 FAST)，組織能夠運用創新技術，取得邁向成功的永續競爭優勢。

Figure 1 illustrates the Job Plan process flow. Each of the Job Plan phases must be performed in sequence because each phase provides information and understanding

necessary for the successful execution of the next phase. As the team gains additional knowledge about the project, a previous phase may be revisited

圖 1 說明工作計畫的程序。因為每個階段提供的資料和分析，是下個階段能否成功執行的關鍵，所以工作計畫的每個階段必須循序執行。倘若研析小組取得專案新資訊，則先前的階段也許需要重來。

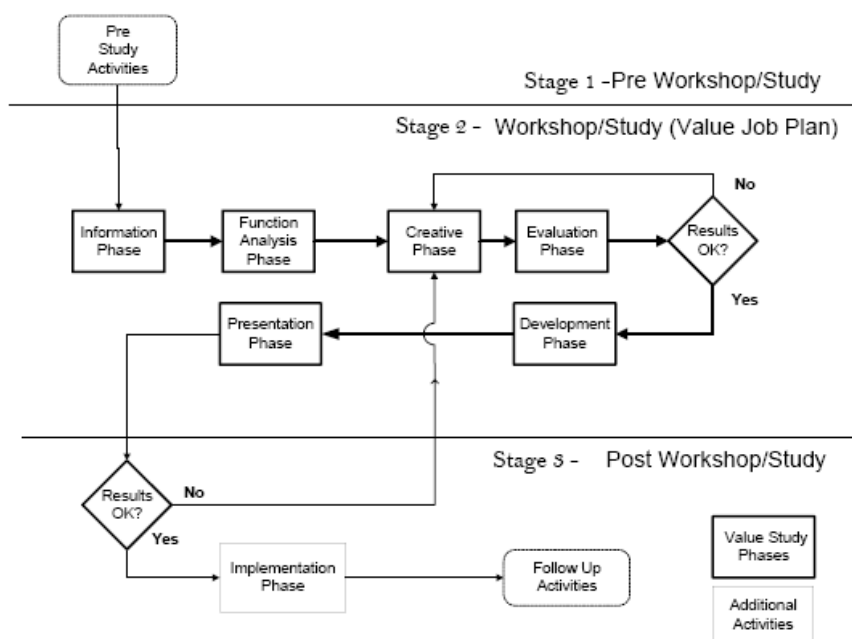


Figure 1. Value Study Process Flow Diagram

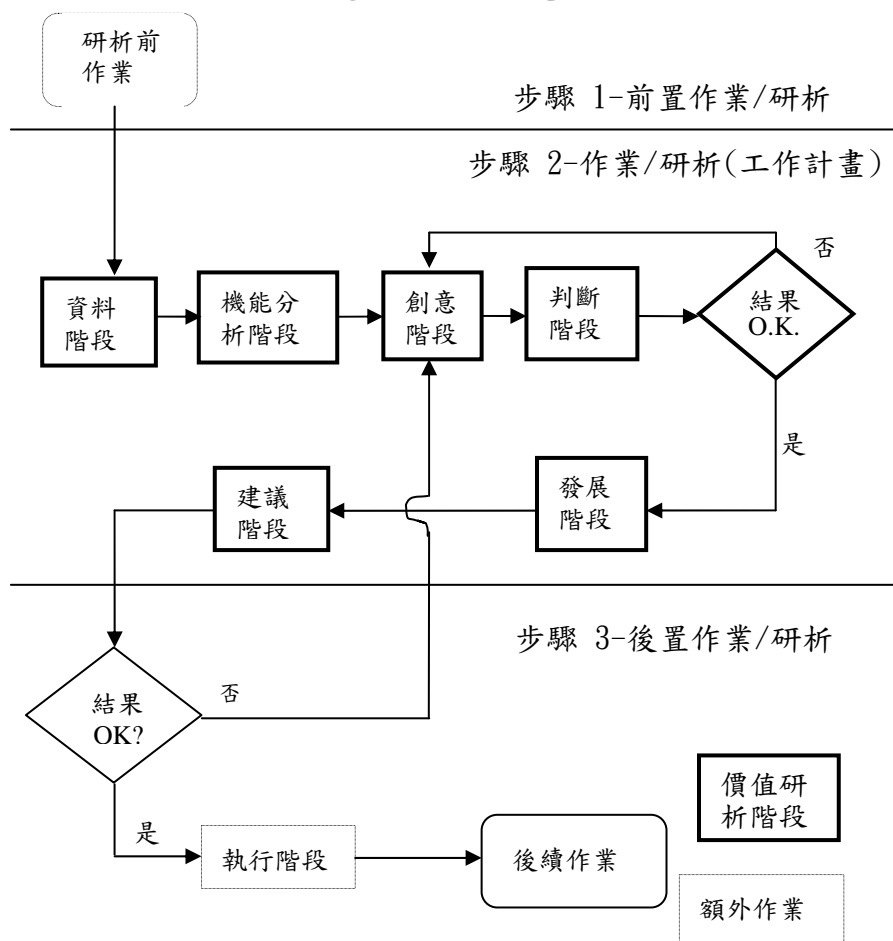


圖 1. 價值研析程序流程圖

Workshop Activities

4.6. 研析作業

The standard Three-Stage of Pre-Workshop, Workshop and Post-Workshop; and Six-Phase Workshop Job Plan Activities; are described on the following pages with related activities and suggested tools and techniques.

標準作業包括三個階段：研析前置作業、研析作業和研析後續作業；其中研析作業的工作計畫又分成六個階段；各階段相關活動內容、建議工具和技術詳見下列說明。

Pre-Workshop Activities

4.6.1. 研析前置作業

Purpose:

Plan and organize the Value Study

目的：

計畫和組織價值研析。

Fundamental Question:

What has to be done to prepare for a Value Study?

基本問題：

價值研析必須做什麼準備？

Common Activities:

常見活動：

- Obtain senior management concurrence and support of the job plan, roles, and responsibilities.
- 獲得高階主管對工作計畫、角色、及責任的認同和支持。
- Develop the scope and objectives for the Value Study
- 發展價值研析範疇和目標。
- Obtain project data and information
- 蒐集專案資料和資訊。
- Obtain key documents such as scope of work definition, drawings, specifications, reports, and project estimate
- 蒐集關鍵文件，譬如工作範疇定義、圖說、規範、報告和預算。
- Identify and prioritize strategic issues of concern
- 確認關切的議題和優先順序。
- Determine the scope and objectives of the study
- 確認研析範疇和目標。
- Develop the study schedule
- 確認研析進度。
- Undertake competitive benchmarking analyses

- 進行競爭個案的標竿分析。
- Identify Value Team members
- 確認價值研析小組成員。
- Obtain commitment from the selected team members to achieve the project objectives
- 取得小組成員對達成專案目標的共識。
- Review the project costs
- 檢視專案成本。
- Gather appropriate customer/user information about the project
- 蒐集有關專案客戶與使用者的適當資訊。
- If appropriate, invite suppliers, customers, or stakeholders to participate in the Value Study.
- 如果適切，邀請供應商、客戶和利害關係人參加價值研析。
- Distribute information to team members for review
- 分發資料給小組成員檢視。
- Develop informational models and diagrams about the project
- 發展專案之資料模式和圖表。
- Determine the study dates, times, location and other logical needs
- 確定研析日期、時間、地點和其他相關需求。
- Clearly define, with senior management, the requirements for a successful Value Study results

- 與高階主管明確定義成功價值工程研析之要項。

Typical Outcome:

典型結果:

The desired outcome is a clear understanding of what senior management needs to have addressed, what the strategic priorities are, and how improvement will increase organizational value. It is during this phase that a view is formed as to whether subsequent phases are likely to yield sufficient value to justify the cost of the study within the terms set. It may be appropriate to increase or decrease study parameters at this time. Team members are knowledgeable of and committed to achieve the project's objectives.

期待的結果是明確瞭解高階主管需求、策略優先順位、以及將如何提昇組織價值。此階段整體輪廓已成形，吾人可研判後續階段之研析成本是否應酌予調整，或增減研析參數。小組成員已充分瞭解本案相關資訊，並產生達成研析目標之共識。

Workshop (Job Plan) Activities

4.6.2. 研析作業 (工作計畫)

Information Phase

資料階段

Purpose:

Understand the current state of the project and constraints that influenced project decisions.

目的:

瞭解專案現狀和影響專案決策的限制條件。

Fundamental Question:

What is really going on in the tactical and operational contexts?

基本問題:

在策略與執行上的來龍去脈到底是什麼？

Common Activities:**常見活動**

- Obtain project data and information and key documents such as scope of work definition, drawings, specifications, reports, detailed project cost information, quality data, marketing information, process flow charts, etc.
Tools: Quality Function Deployment, Voice of Customer
- 獲得專案資料、資訊和關鍵文件，譬如工作範疇定義、圖說、規範、報告、專案成本的詳細資訊、品質資料、市場資訊、流程圖等。
工具：品質機能展開，顧客意見。
- Identify and prioritize strategic issues of concern. Further define the scope and objectives (management expectations) of the study
Tools: SWOT (Strengths, Weaknesses, Opportunities and Threats); Project Charter
- 確認關心的議題並決定優先順序，進一步定義研析範疇和目標(管理者的期望)。
研究工具: SWOT 分析【優勢(Strengths)、劣勢(Weaknesses)、機會(Opportunities)和威脅(Threats)】;Project Charter 專案核准書【闡述專案的目標，並指派專案經理，是一種正式的授權及責任付與】。
- Project Team presents the original and/or present design/product/process concepts
- 專案小組對原始和/或目前的設計/產品/程式概念提出簡報。
- Perform competitive benchmarking analysis
Tools: Benchmarking, Tear Down Analysis, Pareto Analysis, Design for Assembly

- 對競爭個案執行標竿分析。
工具：標竿、拆解分析、柏拉圖分析、組裝設計。
- Determine the study schedule; dates, times, location and other logistical needs
- 確定研析時程；日期、時間、地點和其他後勤需要。
- Distribute information about the project for team member review
- 將專案的資料分送給研析小組成員檢視。
- Understand project scope, schedule, budget, costs, risk, issues, non-monetary performance.
- 瞭解專案範疇、進度、預算、成本、風險、爭議和非財務的性能。
- Confirm the most current project concept
- 確認最新的專案概念。
- Identify high-level project functions
- 辨認專案的高階機能。
- Visit site or facility
- 參觀工地或設施。
- Confirm success parameters
- 確認成功因數。

Typical Outcome:

典型結果

This phase brings all team members to a common, basic level of understanding of the project, including tactical, operational, and specifics of the subject. The functional

understanding establishes the base case to identify and benchmark alternatives and mismatches and set the agenda for innovation.

此階段是讓所有研析小組成員，能對專案有一個共同、基本的理解，包括策略、操作和特定項目上。並在對機能認知的前提下，建立基本狀況，以便辨識及規範替代方案與不協調的部份，且可擬定創新的議程。

Function Analysis Phase

機能分析階段

Purpose:

Understand the project from a functional perspective; what must the project do, rather than how the project is currently conceived.

目的:

從機能角度去瞭解專案，該專案應該執行什麼，而非專案目前呈現之表相或構想。

Fundamental Question:

What are the functions and how are they related?

基本問題:

什麼是機能和他們之間關係?

Common Activities:

常見活動

- Identify the project functions (team format strongly encouraged)
Tools: Random Function Identification
- 確認專案機能(強烈鼓勵團隊型式討論)。
工具：隨機機能定義。
- Classify project functions

- 分類專案機能。
- Develop function models
Tools: Function Analysis System Technique (FAST), Function Tree
- 發展機能模式。
工具：系統化機能分析技術(FAST)，機能樹等。
- Dimension the model with cost drivers, performance attributes and user attitudes to select value mismatched functions to focus the creativity phase
Tools: Cost to Function Analysis (Function Matrix), Failure Measurement Error Analysis (FMEA), Performance to Function Analysis, Relate Customer Attitudes to Functions
- 發展以成本、性能屬性、和使用者的態度為度量標準的模型，選擇價值被錯置的機能，作為創意階段的焦點。
工具：機能成本分析（機能矩陣）、失效計量誤差分析(FMEA)、性能對機能分析、關聯客戶的態度對機能分析等。
- Estimate worth of functions to select value-mismatched functions on which to focus the creativity phase.
Tools: Value Index (function cost/function worth)
- 估計機能價值以選擇價值被錯置的機能，作為創意階段的焦點。
工具：價值指數(機能成本/機能價值)

Typical Outcome:

典型結果

This phase focuses the team on validating that the project satisfies the need and objectives of the customer. It provides a more comprehensive understanding of the project by focusing on what the project does or must do rather than what it is. The team identifies value-mismatched function(s) on which to focus in order to improve the project.

此階段團隊聚焦於確認專案能否滿足顧客的需要和目標。藉由專注於什麼是專案要做或必須做，而不是它是什麼，來增進對專案更加全面的理解。團隊需從中辨認價值被錯置的機能，以便將焦點關注於如何改進專案。

Creative Phase

創意階段

Purpose:

目的

Generate a quantity of ideas related to other ways to perform functions

產生執行機能的大量構想。

Fundamental Question:

基本問題:

How else may the functions be performed?

還有什麼其他方法可以達成機能?

Common Activities:

常見活動

- Conduct creative warm-up exercises
- 執行創意的熱身活動。
- Establish rules that protect the creative environment being developed
Tools: Creativity “Ground Rules”
- 建立規則，以保護發展創意的環境。
工具：創意「基本規則」。

- Employ group idea stimulation techniques
- 使用小組創意激發技術。
- Generate alternate ideas that may improve value.
Tools: Brainstorming, Gordon Technique, Nominal Group Technique, TRIZ, Syntetics
- 產生能提昇價值的替代構想。
工具: 腦力激盪法、高登法、群體提案評估法、TRIZ、舉偶法等。

Typical Outcome:

典型結果

The team develops a broad array of ideas that provide a wide variety of possible alternative ways to perform the function(s) to improve the value of the project.

小組發展大量構想，提供各種達成機能的可能替代方式，以提昇專案的價值。

Evaluation Phase

判斷階段

Purpose:

目的

Reduce the quantity of ideas that have been identified to a short list of ideas with the greatest potential to improve the project

歸納構想數量，成為俱備最大改進專案潛力之少數構想。

Fundamental Question:

基本問題:

Of all these ideas, which are worth spending quality time to further develop?

所有創意構想，那些是值得花費時間來進一步發展？

Common Activities:

常見活動

- Clarify and categorize each idea to develop a shared understanding
- 澄清和分類各個創意構想，使研析小組成員能充分瞭解。
- Discuss how ideas affect project cost, and performance parameters.
Tools: T- Charts
- 討論創意構想如何影響專案成本及性能參數。
工具：T-圖
- Select and prioritize ideas for further development
Tools: Pugh Analysis, Kepner-Tregoe, Life Cycle Costing, Choosing by Advantages (CBA), Value Metrics
- 選擇要進一步發展的創意構想，並排列其優先順序。
工具：Pugh 分析、Kepner-Tregoe、壽年成本分析、優勢選擇(CBA)、價值矩陣。
- Explain how ideas are to be written as stand-alone risk-reward investment proposals
- 解釋如何將創意構想寫成如獨立之風險-報酬投資的建議案。

Typical Outcome:

典型結果

The team produces a focused list of concepts that warrant quality time to develop into value-based solutions that can be implemented into a project or a project feature.

小組產生經篩選、評估後之構想表，以在時間內進一步發展成可運作、可提昇專案價值之解決方案。

Development Phase

發展階段

Purpose:

目的

Further analyze and develop the short list of ideas and develop those with merit into value alternatives.

將判斷階段整理過的創意構想做進一步分析和發展，以尋求有價值的替代方案。

Fundamental Questions:

基本問題

What is an informed description of each selected idea? What is the rationale for making this change? Which ones are mutually exclusive and are independent?

每個經選擇的創意構想之具體描述是什麼？變更的理由是什麼？哪些創意構想是互相排斥和獨立的？

The selected ideas are developed into value alternatives that are clearly written so that the owner and other project stakeholders understand the intent of the alternative and how it benefits the project. Write-ups also identify any potential negative factors associated with the alternative. The alternative should include text, sketches, diagrams, assumptions, supporting calculations, vendor information, cost comparison work sheets, and other information which may be necessary to convey the intent of the alternative. The text should also identify other alternatives which may be enhanced or complemented by acceptance of an alternative. Issues addressed include reliability, customer convenience, quality control, capital cost, O&M cost, life cycle cost, schedule, risk, availability, political ramifications, and perception. Ideally, an action plan is developed for each alternative. The action plan should, at a minimum, include what needs to be done, who will do it, and when it will get done.

將選擇的創意構想進一步發展，清楚的寫成有價值的替代方案，使業主和相關利害關係人瞭解替代方案的意圖和對專案的益處，寫成檔也可以確認替代方案有否任何潛在的負面因素。替代方案應該包括主題、草圖、圖、假設條件、初步經費演算、廠商資料、成本比較工作表和其他表達替代方案的必要資料。也應該包含受可能被接受替代方案影響的其他替代方案的文件。必要的內容包括可靠性、顧客便利性、品質管理、花費成本、營運維修成本、壽年成本、進度、風險、有效性、政治分歧和感覺等。理想情況下，每個替代方案須發展一個執行計畫，執行計畫最少應該包括需要做什麼？誰去做？何時將完成？

Common Activities:

常見活動：

- Compare the study conclusions to the success requirements established during the Information and Function Analysis Phases
- 將研析結論與在資料階段和機能分析階段所設定的成功需求條件相互比較。
- Prepare a written value alternative for each idea selected for further development
- 將經過選擇要進一步發展的替代構想，準備價值工程替代方案書面檔。
- Assess and allocate risk judgments and costs, where appropriate
- 適當的估計費用和分配風險。
- Conduct cost-benefit analysis
- 進行成本效益分析。
- Generate sketches and information needed to convey the concept
- 準備需求的草圖及相關資訊以表達概念。
- Confirm that an alternative should be further developed
- 確認哪些替代方案應該更進一步發展。

- Finish initial alternative development
- 完成最初替代方案的發展。
- Develop an action plan to define implementation steps, dates, and responsibilities for each value alternative
- 每個有價值的替代方案，均發展一個實施計畫，定義其實施步驟、日期和責任。

Typical Outcome:

典型結果

The Value Study team creates alternatives and low-, medium-, and high-risk scenarios and offers these alternatives to senior management as options that address the Pre-Workshop strategic objectives.

價值研析團隊完成低、中、和高風險等不同情境的替代方案，依照前置作業所定的策略目標，向高階主管提出報告。

Presentation Phase

建議階段

Purpose:

目的

Present value alternatives to management team and other project stakeholders or decision makers.

對管理團隊和其他專案利害關係人、或決策者簡報價值替代方案。

Fundamental Question:

基本問題：

How can we help the project team and senior managers make more informed decisions so that they can select ideas that fit their strategic plans?

我們如何幫助專案團隊和高階主管做出更明智的決策，以選擇適合其計畫策略的構想？

Common Activities:

常見活動：

- Prepare presentation and supporting documentation
- 準備簡報和需要的檔。
- Compare the study conclusions to the success requirements established during the Information and Function Analysis Phases
- 比較研析結論與在資料階段和機能分析階段所設定的成功需求條件。
- Offer to management “risk-reward” innovation scenarios to select value alternatives for implementation
- 提供高階主管「風險-報酬」創新情境，以便選擇可執行的價值替代方案。
- Exchange information with the project team
- 與專案團隊交換意見。
- Ensure management has full and objective information upon which they can make decisions
- 確認管理階層有充分和客觀資訊，以為決策之依據。
- Outline an anticipated implementation plan
- 草擬實施計畫。
- Prepare formal report

- 準備正式報告。

Common Value Study products include a briefing document, risk analysis; cost vs. worth comparisons; Present worth analysis; advantages vs. disadvantages

一般的價值研析成果包括一份簡報檔、風險分析、成本對價值比較、現值分析、優缺點比較等。

Typical Outcome:

典型結果

Ensure management and other key stakeholders understand the rationale of the value alternatives. Also generate interest to sanction implementation.

確認管理階層和其他關鍵利害關係人，瞭解此價值替代方案之基本內涵，並且產生興趣認可實施。

Post-Workshop Activities

4.6.3. 研析後續作業

Implementation Activities

實施階段作業

Purpose:

目的

Ensure accepted value alternatives are implemented and that the benefits projected by the Value Study have been realized.

確認被接受的價值替代方案已經實施，且價值研析對專案的效益也已經落實。

Fundamental Question:

基本問題

What are the program changes, and how will the project team manage them?

計畫產生甚麼改變，以及計畫小組將如何處理？

Following delivery of the value study preliminary report, management and the project team should consider and agree upon the value alternatives to be implemented and then how and by when the implementation will occur. In some instances, additional study and information may be required. Implementation of alternatives is the responsibility of management with assistance from the project and value teams.

依據提送之價值研析初步報告，管理階層及計畫專案小組，應對價值替代方案之落實方式及時機產生共識。在某些案例中，有時須進行額外的資訊及研析。替代方案的落實，是管理階層的責任，但需要專案團隊及價值研析小組的協助。

Common Activities:

常見活動

- Review the preliminary report
- 檢視初步報告。
- Conduct an implementation meeting to determine the disposition of each value alternative.
- 辦理實施會議，以決定每一價值替代方案之處理方式。

- Establish action plans for those alternatives accepted and document the rationale for the rejected alternatives
- 對被接受之替代方案建立工作執行計畫，並為被拒絕之替代方案記載被拒原因。
- Obtain commitments for implementation
- 取得實施之承諾。
- Set a timeframe for review and implementation of each value alternative
- 訂出時間表，以檢視並實施每一價值替代方案。
- Track value achievement resulting from implemented alternatives
- 對實施之替代方案，追蹤檢視價值成果。
- Sign off deliverables
- 簽署相關文件。
- Validate benefits of implemented change
- 驗證執行變更的效益。
- Ensure that new practices become embedded by establishing and managing an implementation plan
- 確認經由實施計畫之執行，新的管理模式已建立。

Typical Outcome:

典型結果

The project stakeholders determine what will be changed in the project as a result of the Value Study. These are changes to the original concept or base case of a study, resulting from the value alternatives, that the project development will incorporate in future design or product development activities.

專案利害關係人應決定接受那些價值研析成果，這些替代方案係基於原始構想所導致之變更，因此將融入未來之設計或產品開發活動。

Value Study Follow-Up Activities

價值研析後續追蹤作業

Purpose:

目的：

Follow up on implementation of the Value Study results and improve the application of a value methodology for future studies.

追蹤價值研析實施成果，並於後續研析改進價值方法論的應用。

Fundamental Question:

基本問題

What have we learned about how best to create or improve value of the subject under study?

在專案研析中，關於「所創造或改善之價值有多好」，我們學習到什麼？

Common Activities:

常見活動

- Prepare a report of the results of the study, lessons learned, or other items to be recorded and/or tracked through implementation
- 就研析成果之實施、學習之經驗以及其他其他追蹤、落實建議案之過程中值得紀錄之事項，做詳實之報告。
- Identify where opportunities were missed

- 指出何處錯失良機。
- Identify roadblocks to innovation and understand why they existed
- 指出在創意過程中所遭遇的障礙，並瞭解其存在原因。
- Debrief and record lessons learned
- 聽取並紀錄所獲得之經驗。
- Integrate Value Study results into organization's lessons learned or program reporting
- 整合價值研析成果，成為組織內的學習經驗或計畫報告。
- Reflect on the value study and consider how the experience has developed new capabilities
- 思考如何將價值研析經驗發展成新的能力。

Typical Outcome:

典型結果

Individuals become better value creators by reflecting on theories they held before the value study, comparing the way things turned out, and ascertaining how that knowledge affects the way they believed their own theories in the first place. This is a key step in learning what will help the organization become better at managing innovation.

經由價值研析前反映他們所擁有之學理，比較事情演變之結果，以及確定知識如何影響人們原先所深信不疑的學理，個人可成為較佳之價值創造者。協助組織經營較佳之創新，此為關鍵步驟。

Roles and Responsibilities

4.7. 角色及責任

Management

管理階層

The roles and responsibilities of the Value Manager vary throughout the life of the project.

價值經理的角色及責任在專案的生命週期中會不斷的改變。

The aim of a value methodology is to increase organizational value through a union of strategy, tactics, and operations with emphasis on “customer need,” cost effectiveness, and/or profitability. The link between the Value Study and the organization is the role of management in value improvement. Two key management roles exist: Senior Management and the Value Manager.

價值方法論之目的在於結合策略、戰術，在運作上強調客戶需求、成本效力、提高利潤等以提高組織價值。管理階層在價值改善過程，扮演價值研析與組織間連結的角色。高階主管與價值經理，為二大主要關鍵角色。

Senior Management responsibilities are to provide clear leadership and make strategic expectations explicit in a purposeful and prioritized manner. Senior management should understand the potential benefit from a Value Study, approve the expenditure of resources necessary to support the study, and guide the implementation for approval of required funding necessary to realize the recommendations.

高階主管負責提供明確的領導方針，預測未來趨勢，擬定行動方針與執行的優先順

序。高階主管應當瞭解價值研析的潛在價值，支援並撥付價值研析所必需的經費與資源，並核准完成建議案所需之資金。

The roles and responsibilities of the Value Manager (an organization's designated manager of value) vary throughout the life of the project. At all times the Value Manager should confirm that value methodology activities are coordinated and performed effectively in order to meet the goals and objectives of the organization. A value methodology can be used throughout project development with a different focus at each stage.

價值經理（組織所指定之價值工作負責人）所扮演之角色與責任，在專案生命週期中隨時間不同而有所差異。價值經理應隨時確認價值研析是否經過整合並有效率地執行，以符合組織目標。價值方法論可以依不同重點，運用在專案發展之不同階段。

At the conceptual stage, a value methodology can be used to determine the cost versus the worth of basic project functions. At this early stage it is the Value Manager's responsibility to ensure that all parties who have a vested interest in the project participate in the Value Study, including suppliers, customers, clients, end users, and possibly outside interests, in order to gain the total perspective of real 'needs' vs. 'wants' so as to provide the maximum value for the project being studied.

在概念階段，價值方法論可應用於決定專案主要機能之「成本」與「價值」之關係。在初期發展階段，價值經理之職責為確認各單位有興趣參與價值研析，包括供應商、顧客、業主、最終使用者及其他可能對本專案有興趣單位元，確認「需要」與「想要」，進行全面性瞭解，以追求研析標的最大價值。

As the project approaches the design phase, a value methodology focuses more on the functions of each element or component within the detailed design, with the results of function analysis and creativity being more limited since resources have been allocated and money spent. It is senior manager's responsibility during a Value Study at this stage of the project to assess which value alternatives are economically feasible based upon the requirements of the customer or client.

當專案進入設計階段，價值方法著重於細部設計每一零件或組件之機能。此時因為資源已分配及金錢已花費，機能分析及創意受到更多限制。本階段高階主管職責，為依據客戶或業主需求，評估何種價值替代方案較為經濟可行。

As a project moves into the implementation phase (construction or production), a value methodology process works to ensure changes are made. Although many projects can still

benefit from a Value Study at this stage of a project, it is the responsibility of the Value Manager to encourage early involvement of the organizations that are affected by the changes to ensure the maximum benefit for any Value Study. For any given project, it is important that the senior management team be made aware that the earlier a Value Study can be performed, the more potential benefit there will be for the client or customer.

當專案進入實施（施工或生產）階段，價值方法可確認所提出之建議案是否被落實。儘管研析於此階段才導入價值研析，仍可替專案創造效益，但價值經理仍應鼓勵受價值研析結果變更所影響的單位儘早參與，以使價值研析所創造之利益最大化。對任何專案而言，高階主管團隊應瞭解，價值研析愈早開始，業主或顧客愈可獲得愈大之潛在效益。

Another role of the Value Manager is to ensure that the proper amount of Pre-Workshop activities take place prior to any Value Workshop. These Pre-Workshop activities may not need the attention of the whole team. However, a successful Value Study is unlikely without proper planning and information sharing so all interested parties have a clear understanding of the purpose and details of the project. This, again, is the responsibility of the Value Manager in charge of the project. If these details are properly communicated with the clients and customers involved, the potential for a successful Value Study is greatly increased.

價值經理的另一職責為在價值研析前，確認已充份執行研析前置作業，雖然前前置作業也許並不須全研析小組全部參加。但無論如何，成功的價值研析應有充份的事前規劃與資訊分享，使得專案各相關單位，應清楚瞭解研析標的之目標與細節。價值經理仍需負責與業主或客戶充份溝通，並邀請其積極參與，如此將可大幅增加價值研析成功的機會。

Executive Review Board: Senior managers set the initial strategic goals for the Value Study and, at a later date, decide which outputs will be invested so they can be implemented. These managers do not always participate in the day-to-day working of the Value Study but are part of the overall value program.

審查執行小組：高階主管對價值研析設定初期策略目標，並決定哪項研析成果應加以執行。高階主管不需天天參與價值研析工作，但仍是整體價值計畫之一部份。

Sometimes managers are designated as Sponsors or Champions to support a value study and/or the value program within an organization.

有時經理人可表揚績優人員，以支持組織內的價值研析或價值計畫。

Technical Champions: Those members of the Value Study team who are selected because of their technical expertise.

技術性績優人員：價值研析小組中因技術類專長而被選出之成員。

Value Team Members

價值研析小組成員

Value Team members are expected to participate in a Value Study in the following ways:

研析小組成員應參與下列價值研析工作：

- Participate in all meetings
- 參與所有會議。
- Gather information as requested
- 蒐集所需要的資訊。
- Analyze information
- 分析資訊。
- Identify functions
- 確認機能。
- Contribute ideas
- 提供創意構想。
- Evaluate ideas using their experience and expertise

- 依據經驗及專業知識評估創意構想。
- Develop alternatives
- 發展替代方案。
- Present results
- 提出研析成果。

Team Members' Responsibilities

小組成員職責

1. Keep accurate notes as assigned by team leader

依據領隊指派，製作精確完整的紀錄。

2. Consult with team leader on any problem that may handicap progress

就任何可能阻礙研析進行之問題與領隊商議。

3. Show respect through timely attendance

準時出席會議。

4. Share workload equally whenever possible

儘可能的平均分攤工作。

5. Be willing to admit if they don't know; but strive to get the answer. Don't be afraid to make mistakes

當不知問題答案時願意承認，但同時也積極尋求解答，不要害怕犯錯。

6. Stay focused - avoid tangents - follow the basic problem-solving steps and get help

from Value Team Leader on what techniques may be most suitable for the particular problem

專注於討論焦點，避免岔出主題，依循基本問題解決步驟，依照領隊所選擇解決特定問題的方法，一步一步解決問題。

7. Don't waste time discussing whether or not a step should be used; do it and evaluate it all after the entire workshop

不要浪費時間討論某步驟是否應採用，研析工作完成後再加以討論或評估。

8. Understand the approach being taught and its purpose, including the reason for each step and the technique being applied

充份瞭解受教的方法及其目的，包括每一步驟的原因及所應用的技術。

9. Do the job together as a team. Don't force individual solutions - sell them! Remember, there can be more than one solution to a problem

以團隊合作的方式執行工作，不強迫別人接受自己的解決方案，而是推銷它們。請記住一個問題可能有一個以上的解決方式。

10. Be a good listener; don't cut people off and don't second guess what other people are going to say and what they are thinking

做一個好的傾聽者，不要打斷旁人發表意見。也不要對旁人的言論及想法進行猜測。

11. Bring all data that bears on the problem – some objective, some subjective. Keep an open mind and don't be a roadblock

準備與問題相關聯之資料與數據，包括主觀與客觀的，保持開放的心胸，不要成為研析的絆腳石。

12. Be enthusiastic about the project and what it is that you are doing

對於研析標的及你所執行的工作保持熱誠。

13. Do not attempt to take over as a Team Leader – be as helpful as possible. Remember, the leader already has a difficult job in trying to guide, control and coordinate the overall effort

不要試圖取代領隊，儘可能成為一個幫助者。請記住，領隊已有艱困的工作，包括引導、控制及協調全團隊的努力成果。

Team Leader

研析小組領隊

The Value Team Leader will plan, lead, and facilitate the Value Study. Other key responsibilities are noted below.

價值研析小組領隊應計畫、引導及帶領價值研析作業。其他主要責任說明如下：

This individual is also expected to have numerous skills and experience that are listed in Key Competencies for Value Practitioners (See Key Competencies for Value Practitioners). To ensure that the Team Leader is trained and qualified to lead the team, that person shall be a CVS (Certified Value Specialist) as certified by SAVE International, or equivalent, as defined elsewhere in this Standard.

領隊亦應具備多種專業技能與經驗，詳「價值實踐者主要專長」所述。為確保領隊受過完整訓練及符合資格，領隊應具備國際價值協會（SAVE International）所頒授之價值專家（Certified Value Specialist）或同等資格，如同本標準其他章節之說明。

Team Leader's Responsibilities

研析小組領隊職責

1. Ensure proper application of a value methodology and follow the Job Plan.

確保適當運用價值方法並遵循工作計畫。

2. Guide the team through the activities needed to complete the pre-study, the Value Study and the post study stages of a Value Study.

引導研析小組完成價值研析之研析前置作業、價值研析作業、及研析後續作業。

3. Delegate responsibilities as appropriate

適當的分配任務。

4. Schedule follow-up team meetings and prepare the agenda

排定小組後續會議時間並準備會議題綱。

5. Keep team focused on specific topic

持續使小組專注於特定議題。

6. Keep team members involved in the discussion and the work that needs to be done

持續使小組成員充份參與討論並協力完成工作。

7. Keep all team members together whenever possible. It is desirable that everyone breaks together, to maintain team continuity

使小組成員儘可能的共同行動，以維持小組之一致性。

8. Be a catalyst to keep team moving and motivated. Be diplomatic; not dictatorial.

成為鼓舞研析小組向目標前進的催化劑。凝聚共識，不獨斷獨行。

Standard Revision Process

4.8. 標準修正程序

The SAVE International Value Standard is intended to provide a practical guide to apply the principles of a value methodology in a consistent manner. It may be used by both practitioners and management.

SAVE International 價值標準，提供一個一致性操作價值方法論之實用指南，以供價值實踐者和管理者使用。

The Value Standard, originally drafted in May 1997, has been through a process of periodic updates to address changes in the business environment and technology, and to meet future integration with the International Standards Organization. Prior to 2007, a formal process for reviewing and updating the Standard did not exist. As part of the 2007 Value Standard update, the following process was developed and adopted to address future updates.

價值標準，最初於西元 1997 年 5 月起草，透過定期更新的程式，呼應產業環境和技術上的變遷，以便於未來能與國際標準組織整合。在 2007 年之前，並無正式的檢核與更新程式，直至 2007 年更新時，發展出以下的程式，以供未來更新採用。

Standard Responsibility

標準的責任

The SAVE International Director of Standards has the primary responsibility for managing the review process and updating the Value Standard and Body of Knowledge. The Director of Standards appoints and maintains a Standards Review Team of experienced practitioners, one member of which (excluding the Director) should be a Fellow of SAVE International who is actively practicing a value methodology full time. Another member will be a

member of the Certification Board. The team shall have a minimum of three members (including the Director of Standards) and a maximum of seven members. This team will perform a review of the document and recommend improvements/changes to the Board of Directors.

SAVE International 標準委員會主任委員主要責任，是控管檢核過程、更新價值標準和知識體系。標準委員會主任委員，任命並帶領由資深價值實踐者所組成的標準檢核團隊，其中一名成員（主任委員之外）應是 SAVE International 的會士(Fellow)，且是全職的價值方法論實踐者，其他成員是授證委員會的成員。團隊應至少有三名成員（包括標準委員會主任委員），最多七人，這個團隊將執行檔的檢核，並提供修正與改進意見給理事會。

The Standard and Body of Knowledge will be reviewed for possible updating every four years, concurrent with the installation of a new SAVE International President. The Director of Standards and the Standards Review Team will review the current Standard and report to the Executive Board any actions necessary to update the Standard. This action will be completed by the fall Board of Directors Meeting following the installation of the new President.

標準與知識體系預計將每四年更新一次，配合 SAVE International 理事長的任期。標準委員會主任委員和標準檢核團隊，將檢核目前使用的標準，將需更新的議題呈報給執行委員會，並由新任理事長與理事會加以執行。

SAVE International members in good standing can, at any time, provide the Director of Standards with a written request to modify or update the Value Standard or Body of Knowledge. When this occurs, the Director of Standards and the Standards Review Team will review the request and provide a recommended plan of action to the Board of Directors.

SAVE International 會員隨時都能以書面方式，要求標準委員會主任委員修改或更新價值標準與知識體系。當發生這種狀況時，標準委員會主任委員和檢核團隊，將確認此要求，並對理事會提出建議。

Once the Board of Directors approves an action to update the Value Standards and Body of Knowledge, the following process will be used to amend the wording or content of this document:

一旦理事會批准更新價值標準和知識體系時，將使用下列程式修正檔：

1. The Board of Directors approves the specific areas of the Value Standards and Body of Knowledge to modify.

理事會批准價值標準和知識體系中哪些部分需要修改。

2. The membership of SAVE International is notified of the scope of changes under review via Interactions, a magazine published by SAVE International. The membership will direct all comments to the Director of Standards.

SAVE International 將透過其出版的 Interactions 雜誌，通報所有會員有何處將進行修正，會員們均可直接對標準委員會主任委員提出修正建議。

3. The Director of Standards may add up to a total of seven members to the Standards Review Team in order to ensure the proper expertise is present on the team to develop the changes.

標準委員會主任委員可增加檢核團隊至七名成員，以確認團隊發展修正內容時，有足夠的專業人員參與。

4. The Director of Standards and the Standards Review Team will:

標準委員會主任委員和標準檢核團隊將：

- a. Develop specific changes to the Standards to address the areas approved by the SAVE Board.

對於 SAVE 理事會所批准修正的部分，發展具體的修正。

- b. Review the rest of the Standard to ensure that the changes do not conflict with the rest of the document.

審查標準的其他部分，確認此修正與文件中其餘內容不相衝突。

5. A Board of Director's Oversight Team comprised of the President, Executive Vice President, and VP of Education will review, provide comments, and issues a preliminary approval of the change.

由理事長、執行副理事長及教育副理事長所組成的理事會監督小組，審查、提供意見，並初步批准此修正。

6. Once the Oversight team has approved the changes, the changes will be submitted to the Certification Board, whose members will review, provide comments, and approve the changes.

一旦理事會監督小組批准初步修正，此修正將遞交給授證委員會，授證委員會將審查、提供意見並批准此修正。

7. Any changes recommended by the Certification Board are to be agreed to by the Director of Standards, Standards Review Team, and Board Oversight Team before the changes are taken to the SAVE International Board for final approval

所有經授證委員會所核可的修正，須經標準委員會主任委員、標準檢核團隊及理事會監督小組同意，再提送 SAVE International 理事會進行最後批准。

8. The SAVE International Board of Directors will review, provide comments, and issue the final approval of the change after any comments are addressed. Any changes made by the SAVE International Board of Directors will be resubmitted to the Certification Board for approval.

在所有的意見均提出後，SAVE International 理事會將審核、提供意見、並且發布最後核定的修正。所有由 SAVE International 理事會所發布的修正，將再傳送給授證委員會以獲得確認批准。

9. If, after going through this process, full agreement has not been reached, a special committee will be formed to resolve this issue. This committee, chaired by the President and comprised of the Certification Board Chair, the Executive VP, the VP of Education, the Dean of the College of Fellows, and the Director of Standards, will resolve any disputes.

如果經過這些程序後，無法取得各單位元全部同意，則須成立特別委員會處理這個議題。這個委員會由 SAVE 理事長主持，成員包括授證委員會主任委員、執行副理事長、教育副理事長、業界的長老、泰斗，和標準委員會主任組成，以便解決所有爭執。

10. Final revision will be posted on the SAVE International website followed by

membership notification of the change.

最後的修正將被張貼在 SAVE International 網站，同時通知所有會員此項修正。

Key Competencies for Value Practitioners

4.9. 價值實踐者的關鍵能力

A Value Practitioner should understand the following principles and be able to effectively communicate them to management and team members. Mastery of these competencies will help ensure effective leadership of a wide range of multidisciplinary Value Study teams.

價值從業人員應該瞭解以下原理，以便能有效地與管理階層及研析小組成員溝通。精通這些能力，將有助於有效率領導來自不同領域的價值研析小組成員。

Value Principles

價值原理

- Historical development of the Value Methodologies
- 價值方法發展史。
- The relationship between an organization's strategies and a value methodology
- 組織策略與價值方法論間的關聯。
- Fundamental value principles, methods, and job plans
- 基本的價值原理、方法、與工作計畫。
- The relationship between value, functions, and solutions
- 價值、機能、與解決方法間的關聯。

- Function analysis
- 機能分析。
- Types of value
- 價值的類型。
- Value drivers (e.g., cost, schedule, quality, risk, user attitudes etc.)
- 價值動因（如：成本、進度、品質、風險及使用者態度等）。
- Investment appraisal techniques
- 投資評價技術。
- Key thought-provoking questions
- 令人深思的關鍵問題。

Value Job Planning

價值工作計畫

- Major phases and activities in a Value Job Plan
- 價值工作計畫中的主要步驟與活動。
- Purpose and objectives of each phase of the job plan
- 工作計畫中各階段之目的。
- Overview of techniques in a typical job plan
- 典型工作計畫之技術概要。

Strategic Problem/Opportunity Framing

策略性問題/機會架構

- Reviewing the business case
- 檢視企業案例。
- Discounted cash flow modeling
- 現金流量折現模式。
- Analysis through key financial ratios
- 透過主要財務比率進行分析。
- Strategic models, decisions, choices, and uncertainties
- 策略模式、決策、選擇及不確定性。
- Identification of causal relationships and their modeling
- 確認因果關係與其模式。
- Identification of attributes and value drivers
- 確認屬性與價值動因。
- Analysis of performance attributes (non-monetary factors that affect value)
- 性能參數分析(影響價值的非金錢因素)。
- Defining the base case and benchmarking.
- 定義主要架構與標竿。

- Determining whether the remaining phases of the value study can justify the client's investment or whether what they have is good, as understood within the terms and references used
- 依據對條件及使用參考資料之瞭解，研判在價值研析的剩餘階段，客戶的投資是否處於有利狀況。

Function Analysis

機能分析

- Purpose and need
- 目的與需求。
- A “thing”, “process”, “product” or “project” and their functions
- 「物件」、「流程」、「產品」或「專案」及其機能。
- Defining functions with active verb and measurable noun context
- 以「主動動詞+可數名詞」定義機能。
- Function classification
- 機能分類。
- Levels of abstraction
- 抽象層級。
- Function Analysis System Technique (using how-why logic)
- 系統化機能分析技術（使用「如何—為何」的邏輯）。

- If-Then and Caused-By logic flows of classical and technical FAST models, often termed “When”
- 古典型及技術型機能系統圖中「假如-然後」及「由—造成」之邏輯程序，經常以「同時」稱之。
- The differences among various FAST diagrams and models (customer, technical, classical, hierarchical)
- 各種機能系統圖型和模式（顧客、技術、古典型、階層型）中的差異性。

Function, Performance, Worth, Cost and Customer Attitude

機能、性能、價值、成本與顧客態度

- Purpose and need
- 目的與需求。
- Cost as resource expenditure
- 成本視為資源支出。
- Performance-to-cost relationships hitchhiking
- 性能相對於成本間之搭便車關係。
- Cost-to-worth relationships
- 成本相對於價值（Cost-to-worth）的關係。
- Cost-to-function allocation
- 成本與機能的分派。
- Function worth identification and understanding

- 機能價值之辨識與瞭解。
- Cost-value relationships
- 成本-價值（Cost-value）關係。
- Cost-value mismatches
- 成本-價值錯置。
- Pareto analysis of major cost drivers
- 主要成本動因的柏拉圖分析。

Creativity

創意

- Purpose and need
- 目的與需求。
- Managing divergent thinking
- 管理發散性思考。
- Brainstorming techniques
- 腦力激盪技術。
- Unrestricted idea generation
- 產生海闊天空的創意構想。
- Large quantity of ideas is the goal

- 目標是大量的創意構想。
- Suspending judgment until the evaluation phase
- 直到判斷階段才須對創意構想進行判斷。
- Other idea generation techniques
- 其他產生創意構想的技術。

Evaluation

判斷

- Purpose and need
- 目的與需求。
- Managing convergent thinking
- 管理收斂性思考。
- Building greater understanding of other people's ideas
- 更深入瞭解其他人的想法。
- Evaluation methods and techniques
- 評估方法與技術。

VM Study Recommendation Documentation

價值研析建議文件

- Document the key information related to a Value Study recommendations
- 將有關的重要資訊整理成價值研析建議案
 - ◆ Original Concept
 - ◆ 原案的概念。
 - ◆ Proposed Change
 - ◆ 建議的變更。
 - ◆ Discussion of benefits of the change
 - ◆ 討論變更的效益。
 - ◆ Cost impact analysis
 - ◆ 成本衝擊分析。
 - ◆ Sketches
 - ◆ 草圖。
 - ◆ Implementation considerations
 - ◆ 執行建議案所需考量事項。
 - ◆ Follow-up actions
 - ◆ 後續行動。
- Investment appraisal
 - 投資評估。
- Technical implementation feasibility

- 執行建議案技術上的可行性。
- Political implementation feasibility
- 執行建議案政策上的可行性。
- Initial and subsequent revenue impacts
- 初始及後續收益衝擊。
- Initial and subsequent cost impacts
- 初始及後續成本衝擊。
- Initial and subsequent schedule impacts
- 初始及後續時程衝擊。
- Life cycle cost analysis
- 壽年成本分析。
- Initial and subsequent impacts on other key attributes
- 在其他主要參數上的初始及後續衝擊。
- Sketches and other communication aids
- 草圖與其他對溝通有輔助作用的事物。

Presentation

建議

- Purpose and need

- 目的與需求。
- The relationship between a value methodology and the needs of senior management decision makers
- 價值方法論與高階經營決策者需求間的關係。
- Presentation skills
- 簡報技巧。
- Content organization
- 內容組織。
- Implementation plan
- 執行計畫。
- Change management strategies
- 變更經營策略。
- Explanation of value tracking process
- 價值運作追蹤程式的說明。

Management of Value Programs

價值計畫管理

- Management roles and responsibilities
- 管理階層角色與責任。

- Reporting responsibilities
- 報告責任。
- Establishing links between Value Study outcomes and organizational results
- 建立價值研析成果與組織成果的連結。
- Value training
- 價值訓練。
- Facilitation skills training
- 領導技術訓練。
- Organizing and implementing Value programs
- 組織及執行價值計畫。
- Team Leader skill development
- 領隊技巧訓練。
- Strategic diagnosis and problem/opportunity identification techniques
- 策略診斷與問題/機會辨識技術。
- Selecting and leading Value Studies
- 選擇與領導價值研析。
- Coordinating Value Study logistics
- 協調價值研析的後勤支援。
- Facilitator skills

- 協調人技術。
- Tracking Value Study implementation results and other reports as necessary
- 追蹤價值研析實施結果和其他必要的報告。
- Coordinating with other organization or client quality improvement programs
- 協調其他組織或客戶品質改善計畫。
- Educating the organization in the value methods
- 以價值方法教育組織。
- Recognizing Value success and failures and how to learn as a team
- 認清價值成敗並學習如何成為一個團隊。
- Sharing value insights with the community and stakeholders
- 與社群及利害關係人分享價值觀點。
- Periodic Value Program review for continuous improvement
- 定期檢核價值計畫以供後續改善之用。

VM Glossary

4.10. 價值方法論詞彙

In 1985, the Lawrence D. Miles Foundation created the College of Fellows of the Society of American Value Engineers (SAVE), now SAVE International, with the specific intent of developing a Glossary of Terms related to value. Over a two year period, approximately 10 Fellows worked individually and in teams to define, refine and finalize a glossary of value related terms. In 2006, the Glossary was reviewed by the Certification Board and those definitions most essential to the current application of value methodologies were identified and refined where necessary.

1985年，邁爾斯（Lawrence D. Miles）基金會創立美國價值工程師協會（現在更名為國際價值協會）的會員學院（College of Fellows），其宗旨之一是要於發展有關價值的一套詞彙。經過2年，大約10個會士（Fellow）先各自研究再共同定義、修改並完成價值相關之詞彙表。2006年，授證委員會將這套對於現今價值方法實務運用相當重要的詞彙表重新檢討、定義與修改。修改後的詞彙整如下。英中名詞對照表則收錄整理於後，詳見表4-1。

序號	名詞/解釋
1	ASSOCIATE VALUE SPECIALIST (AVS) 副價值專家
	AVS is a recognition designed for individuals who are new to the value methodology. An AVS is encouraged to progress to VMP or CVS certification. 副價值專家是價值方法的入門者，AVS 被鼓勵再進階取得價值實踐者(VMP)或價值專家(CVS)執照。
2	CERTIFIED VALUE SPECIALIST (CVS) 價值專家
	CVS is the highest level of certification attainable through SAVE International. Designation is reserved for Value Specialists and Value Program Managers who have demonstrated expert level experience and knowledge in the practice of the value methodology. 價值專家是國際價值協會(SAVE)或中華價值管理學會(VMIT)授予之最高等級執照，分為價值專家和價值計畫經理，具有價值方法實務上的專業經驗與知識。
3	COST 成本
	The expenditure of resources needed to produce a product, service, or process. 生產一項產品、服務或程式的必要支出。
4	COST, LIFE CYCLE 壽年成本
	The sum of all development acquisition, production or construction, operation, maintenance, use, and disposal costs for a product or project over a specified period of time. 一項產品或專案於一特定時期，所有購置、生產或建設、操作、維修、使用及棄置成本的總合。
5	COST MODEL 成本模式
	A financial representation such as a spreadsheet, chart, and/or diagram used to illustrate the total cost of families of systems, components, or parts within a total complex product, system, structure or facility. 針對複雜的產品、系統、結構、或設備中之子系統、組件或零件，用試算表、圖表和圖所表示之成本財務模式。
6	FUNCTION 機能
	The original intent or purpose that a product, service or process is expected to

序號	名詞/解釋
	perform. It is expressed in a two-word active verb/measurable noun structure. 一項產品、服務或流程希望達到的目的，用「主動動詞+可數名詞」來表達。
7	FUNCTION ANALYSIS SYSTEM TECHNIQUE (FAST) 系統化機能分析技術 (FAST)
	<p>A graphical representation of the dependent relationships between functions within a project. 敘述專案內機能關係的圖形。</p> <ul style="list-style-type: none"> ● Classical FAST Model: A function displaying the interrelationship of functions to each other in a “how-why” logic. This was developed by Charles Bytheway. ● 傳統式 FAST 模式：以「How-Why」邏輯表示機能間的關係，由 Mr. Charles Bytheway 所發展。 ● Hierarchy Function Model: A vertical “hierarchical” chart of functions. This places the basic function at the top. The function of each major system is placed beneath the basic function. The functions that support each of these functions are then placed on the next row. This process is continued until the team feels the level of detail is sufficient for the intent of the study. ● 階層式 FAST 模式：為一垂直的機能「階層式」圖形。基本機能位於最上方，各主系統之機能排列在基本機能之下，支援他們的機能排在更下一層。此拆解過程一直持續到研析小組認為足夠詳細為止。 ● Technical FAST Model: A variation to the Classical FAST that adds “all the time” functions, “one time” functions and “same time ” or “caused by” functions. ● 技術導向式 FAST 模式：和傳統式 FAST 模式之差異在於多了「全時機能」、「發生一次的機能」以及「同時機能」、或「起因機能」。 ● Customer-Oriented FAST Model: This variation of the FAST diagram was developed to better reflect that it is the customer that determines value in the function analysis process. Customer-oriented FAST adds the supporting functions: attract users, satisfy users, assure dependability, and assure convenience. The project functions that support these customer functions are determined by using the how-why logic. ● 顧客導向式 FAST 模式：此模式係反映「是顧客在機能分析過程決定價值」。此模式增加以下的支援機能：「吸引使用者」、「滿足使用者」、「保證可靠」以及「保證方便」。如何達成前列四個支援機能，則使用「如何-為何」的邏輯加以探討。
8	FUNCTION ANALYSIS 機能分析

序號	名詞/解釋
	The process of defining, classifying and evaluating functions. 定義、分類以及評價機能的程式。
9	FUNCTION, BASIC 主要機能、基本機能
	The specific purpose(s) for which a product, facility, or service exists and conveys a sense of 'need'. In 'continuous innovation' projects the basic function must always exist, although methods or designs to achieve it may vary. In 'discontinuous innovation' projects, which seek to create new industries, the existence and persistence of the basic function is itself the focus of challenge. 一項產品、設備、或服務所表現的特殊目的，通常為「需求」，對於「持續創新」計畫，基本機能須一直存在；儘管達成的方法或設計可能變更，對於「非持續創新」計畫，想要創造全新的產品，基本機能的持續是挑戰的焦點。
10	FUNCTION COST 機能成本
	The expenditure of resources to perform the function. 為達成某項機能所需花費資源的成本。
11	FUNCTION, HIGHER ORDER 較高階機能
	The specific goals (needs) for which the basic function(s) exists. 為主要機能存在的特殊目標(需求)。
12	FUNCTION, LOWER ORDER (ASSUMED or CAUSATIVE) 較低階機能（假定的機能或起因機能）
	The function that is selected to initiate the project and is outside the study scope. 為啟動專案所需要的機能，在研析範疇之外。
13	FUNCTION, SECONDARY 次要機能
	A function that supports the basic function and results from the specific design approach to achieve the basic function. 為支援基本機能所需要的機能，也是為了達成基本機能所做的特定設計而產生者。
14	FUNCTION, SELL 銷售機能
	A function that provides a subjective expression of something that is to be achieved. In Function Analysis, sell functions are qualitative and are described using a passive verb and a non-measurable noun. Sell functions are also sometimes referred to as "aesthetic" functions. 為主觀展現某事物所需要的機能。在機能分析時，銷售機能是定性的且以「被

序號	名詞/解釋
	動詞+不可數名詞」來描述。銷售機能有時也稱作「美學機能」。
15	FUNCTION, WORK 工作機能
	A function that provides an objective expression of something that is to be accomplished. In Function Analysis, work functions are quantitative and are described using an active verb and a measurable noun. Work functions are also sometimes referred to as “use” functions. 客觀表達某事物應完成的機能，在機能分析時，工作機能是定量的，且以「主動動詞+可數名詞」來描述。工作機能有時也稱作「使用機能」。
16	FUNCTION WORTH 機能價值
	The lowest overall cost to perform a function without regard to criteria or codes. 不考慮標準或法規之前提下，執行機能之最低總成本。
17	JOB PLAN 工作計畫
	A sequential approach for conducting a value study, consisting of steps or phases used to manage the focus of a team’s thinking so that they innovate collectively rather than as uncoordinated individuals. 一個執行價值研析的連續性方法，其步驟包含如何管理研析小組思考的焦點，使共同完成的創新優於個別進行研析。
18	PERFORMANCE 性能
	The capacity of a product to fulfill its intended function. Factors such as reliability, maintainability, quality and appearance are some examples. 產品達到其預期機能的能力。相關因數包括可靠度、可修護性、品質以及外觀等。
19	PROJECT 專案、研析標的
	A temporary endeavor undertaken to create a unique product, service, or result. For the purpose of Value Studies, a project is the subject of the study. It may be a physical product such as a manufactured item, or a structure, system, procedure, or an organization. 生產一個產品、服務、或結果的暫時性努力。針對價值研析，PROJECT 代表的是研析標的，它可以是產品、結構、系統、流程、或組織。
20	PROCESS 程序
	A sequence of activities that delivers a product or project.

序號	名詞/解釋
	生產產品或完成專案的序列性動作。
21	SAVE INTERNATIONAL CERTIFIED PROFESSIONAL 國際價值協會專業授證
	<p>For the purpose of a Value Study, the Job Plan shall be facilitated by a Certified Value Specialist (CVS), or a Value Methodology Practitioner (VMP) working under the supervision of a CVS. SAVE International Certification requirements are identified by the SAVE International Certification Board, which maintains a list of currently certified individuals.</p> <p>價值研析中，工作計畫應由價值專家（CVS）完成，或由價值專家（CVS）協助價值方法實踐者（VMP）完成，SAVE 專業授證規定是由 SAVE 授證委員會頒佈，並會公佈目前合乎規定的授證人員。</p>
22	VMIT CERTIFIED PROFESSIONAL 中華價值管理學會專業授證 (本項為 VMIT 新增)
	<p>價值研析中，工作計畫應由價值專家（CVS）完成，或由價值專家（CVS）協助副價值專家（AVS）完成，VMIT 專業授證規定是由 SAVE 授權，可以在台灣地區以中文辦理 CVS 與 AVS 考試及授證工作，VMIT 網站上將會頒佈授證規定，並公佈目前合乎規定的授證人員。</p>
23	SCOPE 範疇
	<p>The portion of the overall project that is selected for the value study. The analysis accepts everything within the defined scope in order to focus attention on the functions within those limits</p> <p>研析標的中選擇作為價值研析之範疇，分析時接受該範疇內之所有想法以便集中注意力在限定機能上。</p>
24	VALUE 價值
	<p>An expression of the relationship between function and resources where function is measured by the performance requirements of the customer and resources are measured in materials, labor, price, time, etc. required to accomplish that function.</p> <p>機能和資源之間關係的表達。機能是以顧客要求的性能來衡量，資源是以達成該機能所需的材料、人工、價格、時間等來衡量。</p>
25	VALUE ANALYSIS 價值分析
	The application of value methodology to an existing project, produce or service to achieve value improvement.

序號	名詞/解釋
	應用價值方法論以提升一現有專案、產品或服務之價值。
26	VALUE ANALYST 價值分析者
	See VALUE PROFESSIONAL. 參見「VALUE PROFESSIONAL 價值專家」。
27	VALUE ENGINEER 價值專家
	See VALUE PROFESSIONAL. 參見「VALUE PROFESSIONAL 價值專家」。
28	VALUE ENGINEERING 價值工程
	The application of a value methodology to a planned or conceptual project or service to achieve value improvement. 針對一個概念中或規劃中的專案、服務，應用價值方法論以提升其價值。
29	VALUE INDEX 價值指數
	A ratio that expresses function cost ÷ function worth. This ratio is used to determine the opportunity for value improvement, which is usually identified in the Function Analysis Phase. 價值指數=機能成本÷機能價值。此比值用以決定價值改善的機會，價值指數通常於機能分析階段加以確認。
30	VALUE MANAGEMENT 價值管理
	The application of value methodology by an organization to achieve strategic value improvement. 應用價值方法論以達成價值改善。
31	VALUE METHODOLOGY 價值方法論
	A systematic process used by a multidisciplinary team to improve the value of projects through the analysis of functions. See Value Engineering, Value Analysis and Value Management. 為一系統化的過程，由不同專業組成的研析小組，經由機能分析以改善專案價值。參閱價值工程、價值分析、價值管理。
32	VALUE METHODOLOGY ALTERNATIVE (or ALTERNATIVES) 價值方法替代方案（或替代方案）
	An alternative or alternatives prepared by the value study team and presented to management to provide financial and/or performance improvements and which is

序號	名詞/解釋
	<p>within acceptable terms and conditions of the Value Study. 價值研析小組提送給管理階層的替代方案，以提供財務上與(或)性能上的改善，且符合價值研析的規範與條件。</p>
33	<p>VALUE METHODOLOGY PRACTITIONER (VMP) 價值方法實踐者 (VMP)</p>
	<p>VMP recognizes individuals with basic value training and some experience in the application of the methodology. Value methodology practitioners participate in or lead Value Studies. VMP 指受過基本價值訓練，並有一些應用價值方法論的經驗。VMP 參與或領導價值研析。</p>
34	<p>VALUE PROFESSIONAL 價值專家</p>
	<p>One who applies the value methodology principles to study and search for value improvement. Synonymous with value analyst, value engineer, value practitioner, or value specialist. 應用價值方法以執行研析及探究價值改善者。為價值分析者、價值工程師、價值實踐者、價值專家的同義辭。</p>
35	<p>VALUE PRACTITIONER 價值實踐者</p>
	<p>See VALUE PROFESSIONAL. 詳「VALUE PROFESSIONAL 價值專家」。</p>
36	<p>VALUE STUDY: 價值研析</p>
	<p>The application of a value methodology by SAVE International certified professionals using the Value Job Plan. 由具有國際價值協會 (SAVE International) 或中華價值管理學會 (VMIT) 授證之價值專業人員，應用工作計畫所執行之研析。</p>

4.11 英中名詞對照表

序號	英文名詞	中文名詞
1	ASSOCIATE VALUE SPECIALIST (AVS)	副價值專家
2	CERTIFIED VALUE SPECIALIST (CVS)	價值專家
3	COST	成本
4	COST, LIFE CYCLE	壽年成本
5	COST MODEL	成本模式
6	FUNCTION	機能
7	FUNCTION ANALYSIS SYSTEM TECHNIQUE (FAST)	系統化機能分析技術 (FAST)
8	FUNCTION ANALYSIS	機能分析
9	FUNCTION, BASIC	主要機能、基本機能
10	FUNCTION COST	機能成本
11	FUNCTION, HIGHER ORDER	較高階機能
12	FUNCTION, LOWER ORDER (ASSUMED or CAUSATIVE)	較低階機能 (假定的機能或起因機能)
13	FUNCTION, SECONDARY	次要機能
14	FUNCTION, SELL	銷售機能
15	FUNCTION, WORK	工作機能
16	FUNCTION WORTH	機能價值
17	JOB PLAN	工作計畫
18	PERFORMANCE	性能
19	PROJECT	專案、研析標的
20	PROCESS	程序
21	SAVE INTERNATIONAL CERTIFIED PROFESSIONAL	國際價值協會專業授證
22	VMIT CERTIFIED PROFESSIONAL (本項為 VMIT 新增)	中華價值管理學會專業授證 (本項為 VMIT 新增)
23	SCOPE	範疇
24	VALUE	價值
25	VALUE ANALYSIS	價值分析
26	VALUE ANALYST	價值分析者
27	VALUE ENGINEER	價值專家
28	VALUE ENGINEERING	價值工程

序號	英文名詞	中文名詞
29	VALUE INDEX	價值指數
30	VALUE MANAGEMENT	價值管理
31	VALUE METHODOLOGY	價值方法論
32	VALUE METHODOLOGY ALTERNATIVE (or ALTERNATIVES)	價值方法替代方案 (或替代方案)
33	VALUE METHODOLOGY PRACTITIONER (VMP)	價值方法實踐者 (VMP)
34	VALUE PROFESSIONAL	價值專家
35	VALUE PRACTITIONER	價值實踐者
36	VALUE STUDY	價值研析

References

5. 參考資料

Publications Catalog, SAVE International:

Describes textbooks and educational materials on Value Methodologies and related programs. This catalog includes videotapes and information on Value World, SAVE International's peer-reviewed, technical journal.

國際價值協會出版品目錄

敘述價值方法論和相關計畫的教科書與教材，內容包括在 SAVE 的技術期刊「價值世界」(Value World) 的錄影帶、資訊等。

Annual Conference Proceedings SAVE International

Includes all presentations given at each annual conference. Also available is a value bibliography, a compilation of all presentations since 1980, and articles from Value World. Each presentation shows title, author, abstract, and source. Papers may be individually ordered from SAVE International.

SAVE 年會論文集

包括自 1980 年以後發表於年會中的資料、參考書、以及價值世界 (Value World) 等。每個發表資料可查到題目、作者、摘要、和來源。該等資料或許可向 SAVE 訂購。

SAVE International website:

<http://www.value-eng.org>

國際價值協會網址

<http://www.value-eng.org>

“Standard Practice for Performing Value Analysis (VA) of Buildings and Building Systems,” American Society for Testing and Materials, Publication E-1699.

“Standard Practice for Performing Value Analysis (VA) of Buildings and Building

Systems,”美國試驗及材料協會，出版品 E-1699

Value Certification Manuals (on SAVE International website/home/certification)

- Certification/Recertification Manual
- Certified Workshop Manual
- Certification Examination Study Guide
- SAVE International Internet Web Site <http://www.value-eng.org>

授證手冊（公佈於 SAVE 網站）

- 授證/複審授證手冊。
- 研習會手冊。
- 授證考試指引。
- 國際價值協會網址 <http://www.value-eng.org>

Lawrence D. Miles Value Foundation Internet website:

<http://www.valuefoundation.org>

邁爾斯（Lawrence D. Miles）基金會網址

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Techniques of Value Analysis and Engineering, Lawrence D. Miles

Techniques of Value Analysis and Engineering, 邁爾斯 著作（Lawrence D. Miles）