

VALUE MANAGEMENT INSTITUTE OF TAIWAN

中華價值管理學會

**Certification Examination
Study Guide**

授證考試研讀指引



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Chapter 1 Introduction

第 1 章 簡介

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This study guide is written to assist certification candidates in preparing for their written examination. It is intended to assist candidates discover where their knowledge of the value methodology (VM) and its applications need to be strengthened. This guide includes the body of knowledge and the glossary of VM terms as currently found in the Value Methodology Standard. The material taught in the Module I Basic Certification Training Workshop and the Module II Advanced Certification Training Seminar courses closely parallels this body of knowledge. How well you do on the certification examination is a reflection on you, your course instructors and your advisor. The glossary of terms in the VM Standard is new in a few basic ways that will need some adjustment, with time, to be included in our day-to-day vocabulary. The examination however, as an encouragement to the use of standard terms, will follow the definitions listed in the VM Standard.

本項「研讀指引」是協助授證申請人準備考試。希望可以協助申請人發現他們在價值方法論知識及應用等方面需要加強之處。「研讀指引」包括現行價值方法論標準中之知識體系與詞彙，第一級研習班與第二級進階研討班所講授的內容就很接近於知識體系，考試的表現會受申請人、授課講座、以及授證指導人所影響。價值方法論標準中之詞彙是新的，可能需要時間加以校正，後續將加以增補。考試時鼓勵學員使用價值方法論標準中之詞彙為標準用語。

Certification examinations are given each year preceding the VMIT Annual Conference. At other times, candidates may arrange to have the examination proctored locally by an individual approved by the VMIT Certification Committee. The details of arranging for a proctored examination are described in the Certification Program Manual.

授證考試將在中華價值管理學會每年年會前舉辦，其他時間，申請人可安排經由中華價值管理學會授證委員會認可的監考人監督下考試。詳細辦法請參閱授證計畫手冊。

Chapter 2

Examination Objectives

第 2 章 考試目的

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The certification examination is designed to test the candidate's knowledge of fundamental VM concepts through the use of a variety of question formats. Candidates for the different levels of certification (AVS, CVS) will find themselves being asked questions appropriate to that level of certification. (See Table 1) In addition, the essay portion of the examination for CVS candidates tests the ability to articulate comprehensive VM knowledge in response to a particular question. This is intended to measure effective communication abilities as well as knowledge of VM.

Table 1 Examination Matrix

Exam Category	AVS	CVS
Part I Fundamentals 40 Questions Multiple Choice	100 points 30 minutes	100 points 30 minutes
Part II Function Analysis 40 Multiple Choice Questions	100 points 60 minutes	100 points 60 minutes
Part III FAST Diagram Identify, classify functions and draw a FAST Diagram	Not Applicable	100 points 60 minutes
Part IV Team Building 20 Questions (True or False)	Not Applicable	100 points 30 minutes
Part V Certification 25 Questions (True or False)	Not Applicable	100 points 15 minutes
Part VI Financial Identify VM opportunities, first costs, annual costs and break-even point.	Not Applicable	100 points 30 minutes
Part VII Essay Choose a topic and prepare an essay demonstrating VM principles.	Not Applicable	100 points 45 minutes
Total Examination Time	1 ½ hours	4 ½ hours
Score to pass: 70 % 70% achievement is required for each category. Grades will not be averaged.		

授證考試的設計是要透過不同型態的問題來測驗申請人有關價值方法論基本觀念的知識，不同的授證層級（副價值專家、價值專家等）有不同的考試內容，請參閱表 1。其中申論題的部份，是要針對價值專家的申請人，就特定問題綜合應用價值方法論的表達能力。期望透過考試可以鑑別有效溝通的能力與價值方法論的知識。

表一：考試矩陣

考試部分	副價值專家	價值專家
第一部份：基本概念 40 題選擇題	總分 100 分 時間 30 分	總分 100 分 時間 30 分
第二部份：機能分析 40 題選擇題	總分 100 分 時間 60 分	總分 100 分 時間 60 分
第三部份：機能系統圖 機能定義、機能分類、繪製機能系統圖	不考	總分 100 分 時間 60 分
第四部份：小組組成 20 題是非題	不考	總分 100 分 時間 30 分
第五部份：授證計畫 25 題是非題	不考	總分 100 分 時間 15 分
第六部份：財務 VM 機會、初始成本、年金、 損益平衡點	不考	總分 100 分 時間 30 分
第七部份：申論題 選擇題目，進行申論， 說明價值方法論原理	不考	總分 100 分 時間 45 分
考試時間	1.5 小時	4.5 小時
及格分數：70 分 每一部份均須超過 70 分，各部份分數不能平均。		

Chapter 3

Examination Requirements

第 3 章 考試要求

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第 3 章 考試要求

Table 1 shows that each of the two levels of certification have different examination categories. The AVS candidate is required to take the first two parts, the CVS candidate all seven parts. Each part is graded separately on the basis of 100 points. A minimum of 70 percent is required to successfully pass each part. Candidates will be required to retake only those parts failed. Re-examinations can be taken at the candidate's convenience, not to exceed one year from the previous examination. However, the policy is that no more than two re-examinations will be allowed. A CVS candidate who is currently certified as an AVS is required to take only those sections of the examination not previously completed.

由表一得知，二種不同證照有不同的考試部分。副價值專家申請人需要參加第一、二部份的考試，價值專家申請人需要參加全部七個部份的考試。每個部份滿分為 100 分，最少 70 分為及格，若有某部份不及格，申請人必須針對該部份補考，補考時間可由申請人自行斟酌，但不得超過前次考試一年。依照本辦法，補考不得超過二次。價值專家申請人若為現任的副價值專家，只需針對副價值專家未參加過的部份考試即可。

Completion times shown in the individual parts of the examinations are shown only as a guide. The candidate may allocate time as required to each part so long as the examination is completed in the total allowed time.

各部份的考試時間如表一所示，申請人在總考試時間內可自行調度安排適當時間，完成各部份考試。

Chapter 4 Preparation for Examination

第 4 章 考試準備

Chapter 4 Preparation for Examination

第 4 章 考試準備

Part I. Fundamentals

4-1 第一部份：基本概念

The 40 multiple choice questions test your comprehension of the history of the value methodology, including the job plan, function analysis, FAST diagramming, function cost, function worth, creativity, evaluation techniques, program management, certification program and implementation techniques.

Sources:

1. Review text materials from the Module I course.
2. Review the Certification Program Manual, and this Study Guide.

包含 40 題選擇題，測試你對價值方法論的理解，內容包括工作計畫、機能分析、機能系統圖、機能成本、機能價值、創意、判斷技巧、計畫管理、授證計畫以及執行技巧等。

來源：

1. 複習第一級研習班的教材。
2. 複習授證計畫手冊以及本授證考試研讀指引。

Part II. Function Analysis

4-2 第二部份：機能分析

The 40 multiple choice questions require the candidate to answer questions about the common object illustrated in function terms; classify the functions as basic, secondary and higher order functions, their placement on a FAST diagram, and understanding the value index..

Sources:

1. Review Module I function analysis text materials and exercises.
2. Practice with your advisor to gain proficiency. Strive to use action verbs and measurable nouns.

包含 40 題選擇題，需要申請人針對常見的物品定義其機能，將其分類為主要、次要、較高階機能，及其在機能系統圖的位置並了解價值指數。

來源：

1. 複習第一級研習班教材中有關機能分析的部分及其練習題。
2. 在指導人指導下進行練習以更加熟練。努力使用及物動詞和可量化的名詞。

Part III. FAST Work Problem

4-3 第三部份：機能系統圖

The candidate will be required to express the common object illustrated in function terms; classify the functions as basic, secondary, supporting, assumed and higher order functions, to prepare a FAST diagram using those functions. Sixty percent (60%) of the grade for Part III tests your ability to identify the proper functions for a project and its component elements (parts). Also included is credit to properly classify functions. Ten percent (10%) of the grade tests your knowledge to properly label a FAST diagram. All remaining credit (30%) tests your knowledge of creating a FAST diagram using proper function logic (How/Why) and proper placement of functions in the chosen FAST diagram model.

Sources:

1. Review Module I and Module II texts and class exercises.
2. Learn the labeling by studying the material in Appendix A.
3. Practice with your advisor, using all three (3) main types of FAST diagrams.
4. Download and review the Function Monographs on the SAVE website.

考生需要將一般物件的機能標示出來，並分類其機能为基本(主要)、次要、輔助、假設和較高階機能，並使用這些功能繪製機能系統圖。第三部分的百分之六十（60%）測試你正確識別該物件的機能及各組件機能的能力，如能將各機能適當的分類，將可獲得加分；百分之十（10%）測試你正確標示機能系統圖的知識；所剩分數（30%）測試您繪製機能系統圖正確的邏輯（如何/為什麼）知識，並在所選擇的機能系統圖模式下妥善的置放各機能的位置。

來源：

1. 複習第一級研習班與第二級進階研討班教材及其練習題。
2. 在指導人指導下進行練習，包括傳統類、技術類、與顧客類的機能系統圖。
3. 透過附錄 A 學習如何標示機能。
4. 下載並閱讀 SAVE 網站上機能的專著。

Part IV. Team Building

4-4 第四部份：小組組成

This part of the examination recognizes the vital role that teams play in successful value studies and implementation of value proposals. The 20 questions are aimed at testing your knowledge of attributes of team members, team dynamics, consensus building, habits and attitudes, roadblocks to creativity, and making an effective presentation.

Sources:

1. Review text materials from Module I and Module II courses.
2. "Contemporary Value Management Leadership Characteristics", R.A. Fraser, Ph.D, 1996 SAVE International Proceedings
3. "Using Function Analysis to Give Criticism and Influence the Behavior of Teams", Rea Gorin Cook, CCC, CTM, 1997 SAVE International Proceedings

本部份將測驗考生如何組成團隊以執行成功的價值研析和執行價值建議案。包含 20 個題目，將聚焦於測試考生針對小組成員屬性、團隊互動、建立共識、習慣與態度、絆腳石到創意、和辦理有效的簡報等。

來源：

1. 複習第一級研習班與第二級進階研討班教材。
2. 研讀「當代價值管理領導特質」(Contemporary Value Management Leadership Characteristics, R.A. Fraser, Ph.D)，1996 年 SAVE 年會論文集。
3. 研讀「使用機能分析給予批評和影響團隊的行為」(Using Function Analysis to Give Criticism and Influence the Behavior of Teams, Rea Gorin Cook, CCC, CTM)，1997 年 SAVE 年會論文集。

Part V. Certification Program

4-5 第五部份：授證計畫

These 20 questions are aimed at testing your understanding of the general requirements for certification, recertification, workshops and seminars.

Source: Review the Certification Program Manual, Workshop/Seminar Manual, and Study Guide.

包含 20 個題目，目的在測試考生對授證、覆審認證、第一級研習班、與第二級進階研討班等認證需求條件的理解。

來源：溫習授證計畫手冊、研習班與研討班手冊、以及授證考試研讀指引。

Part VI. Financial

4-6 第六部份：財務

Currently there are two sets of questions. One set (five questions) addresses industrial financial analysis. These questions test categorizing costs, calculate value study costs and returns on investment, understanding of initial costs, recurring costs and break-even analysis is tested.

The second set (seven questions) addresses financial analysis. These questions test categorizing contractor costs, calculate value study costs and returns on investment, prioritizing value objectives using calculated value indices (value index), and life cycle costs.

Source:

1. Review Module II text and class exercises.
2. Review this Study Guide and the Value Standard.

包含 2 大部分，第 1 部分 (共 5 個問題) 是工業的財務分析，測試考生有關成本分類、計算價值研析成本和投資回收、經常性費用與損益平衡點計算。

第 2 部分 (共 7 個問題) 是財務分析，測試考生有關營建成本分類、計算價值研析成本和投資回收、利用價值指數決定價值目標的優先順序及壽年成本。

來源：

1. 溫習第二級進階研討班的教材和課堂上的練習題。
2. 溫習本授證考試研讀指引及價值標準。

Part VII. Essay

4-7 第七部份：申論題

The candidate is asked to prepare an essay on one of seven value methodology related questions. As an aid in preparing for this question, the criteria used in grading the question are:

1. Content Relevance (60%) - Has the essay demonstrated a comprehensive knowledge of the subject?
2. Ingenuity of Presentation (20%) - Has the essay presented the material in an interesting format that will inspire the reader?
3. Clarity of Presentation (20%) - Has the essay presented the material logically and in an easily understood order?

Sources:

1. Read a text on creative writing and prepare several essays relating to the unique concepts of the value methodology.
2. Review Appendix B: “What is an Essay?”

考生自 7 個價值方法論相關的題目中選擇 1 題進行申論。評分標準如下：

1. 內容切題（60%）：能否顯示具有對主題廣泛的知識？
2. 獨創性（20%）：申論能否以有趣的架構來吸引讀者？
3. 清晰（20%）申論內容邏輯是否通順且說明架構是否易懂？

來源：

1. 研讀創意寫作方面書籍，並且針對價值方法論中獨特的觀念完成幾篇論說文。
2. 溫習附錄 B 「何謂論文？」

Chapter 5

Comprehensive Review

第 5 章 綜合複習

Chapter 5 Comprehensive Review

第 5 章 綜合複習

While there are number of extremely valuable texts available in the value methodology, the one that stands out for covering all aspects of VM is Value Engineering Theory, by Donald E. Parker (available from the SAVE International bookstore) and its companion, Instructor's Guide for Value Engineering Theory Course. It provides not only a comprehensive text, but it will furnish excellent review questions and answers for each of its 11 basic lectures.

雖然價值方法論上有很多非常有價值的教科書，但特別引人注目能包含所有價值方法論的觀點，是 Donald E. Parker 所著的「價值工程論」(Value Engineering Theory) 和其所附的手冊「價值工程論課程教師指引」(Instructor's Guide for Value Engineering Theory Course)。該書不只是一本綜合性的教科書，並且針對書中 11 個課程提供出色的複習題和解答。(本書可向國際價值協會購買)

In addition, there are several other texts that will be valuable in understanding the value methodology and passing the examination. All are available from SAVE International.

此外，還有其他一些教科書，對瞭解價值方法論和通過考試有相當助益，都可向國際價值協會購買。

Value Engineering for the Practitioner, by J. Jerry Kaufman is aimed at productivity improvements by increasing the value of products and services to the markets and communities.

如：「價值工程的實踐者」(Value Engineering for the Practitioner)，作者為 J. Jerry Kaufman，聚焦於透過增加產品或服務在市場或社會上的價值，以提升生產力。

A third one to consider is Value Analysis in Design by Theodore C. Fowler. Fowler's focus is on how modern methods emphasize customer needs to prevent product denigration by inappropriate cost reduction.

第 3 本為「設計的價值分析」(Value Analysis in Design)，作者為 Theodore C. Fowler，聚焦於強調客戶的需求，避免因為不當的成本降低導致產品的誹謗。

If you want to search for specific aspects of the value methodology, the SAVE International Knowledge Bank offers a comprehensive collection of conference technical papers, Value World papers, and newsletter articles. The Knowledge Bank is located on the SAVE International website.

讀者若需要搜尋價值方法論的特定觀點，SAVE 網站的知識庫提供許多研討會論文、價值世界雜誌論文、和會訊中的文章。

Appendix A – FAST Diagramming

附錄 A - 機能系統圖圖解

Hint: if doing a question on FAST, use the information to draw a FAST first!

提示：如果在回答機能系統圖問題時，先使用所提供資訊繪製一機能系統圖！

Appendix A – FAST Diagramming

附錄 A - 機能系統圖圖解

In the Value Methodology, functions are defined with two words, a verb and a noun. This enhances specific understanding. The noun, if possible, should be measurable and thereby permit quantification for establishing worth.

在價值方法，機能由兩個字詞定義，一個動詞和一個名詞，用以加強對該物件或零組件的具體了解。如果可能的話，名詞應該是可以量化的，從而允許量化該物件並建立其價值。

EXAMPLES

Items	Activity	Function	Unit of Measure
Table	Holds Items	Support Weight	pounds
Screwdriver	Insert Screws	Transmit Torque	ft/lbs.
Electric Wire	Connect Parts	Transmit Current	amperage
Structural Beam	Hold Floor	Support weight	pounds
Report	Mail Report	Communicate Data	words

範例

項目	活動	機能	測量單位
桌子	持有項目	支持重量	磅
螺絲刀	插入螺絲	傳遞扭矩	英尺/磅
電線	連接部件	傳輸電流	安培
結構梁	支撐地板	支持重量	磅
報告	郵寄報告	溝通資料	字元

The first step is to define all the functions that the value study team believes are involved in the project. Then functions are classified as basic or secondary. For small projects, this is a relatively easy task. For complex projects it becomes more involved and literally hundreds of functions can be defined on this random basis. It was for these complex projects, that FAST diagramming was developed.

第一步是價值研析團隊定義所有該物件提供的機能，然後將機能分類為主要或次要的。對於小的計畫，這是一個相對簡單的任務，對於複雜的計畫，這將變得複雜，若在這基礎上隨意定義，將產生數百項的機能。機能系統圖的開發也正是為了這些複雜的計畫。

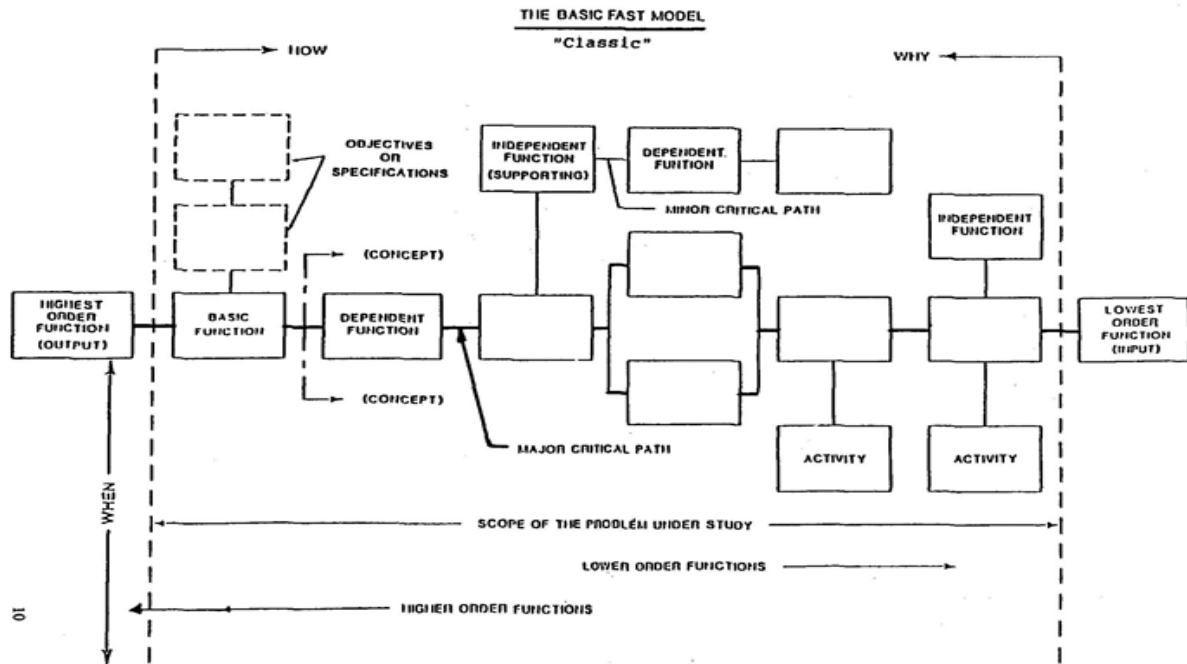
FAST (Function Analysis Systems Technique) is a technique which specifically illustrates the relationships of all functions within a specific project utilizing a How-Why

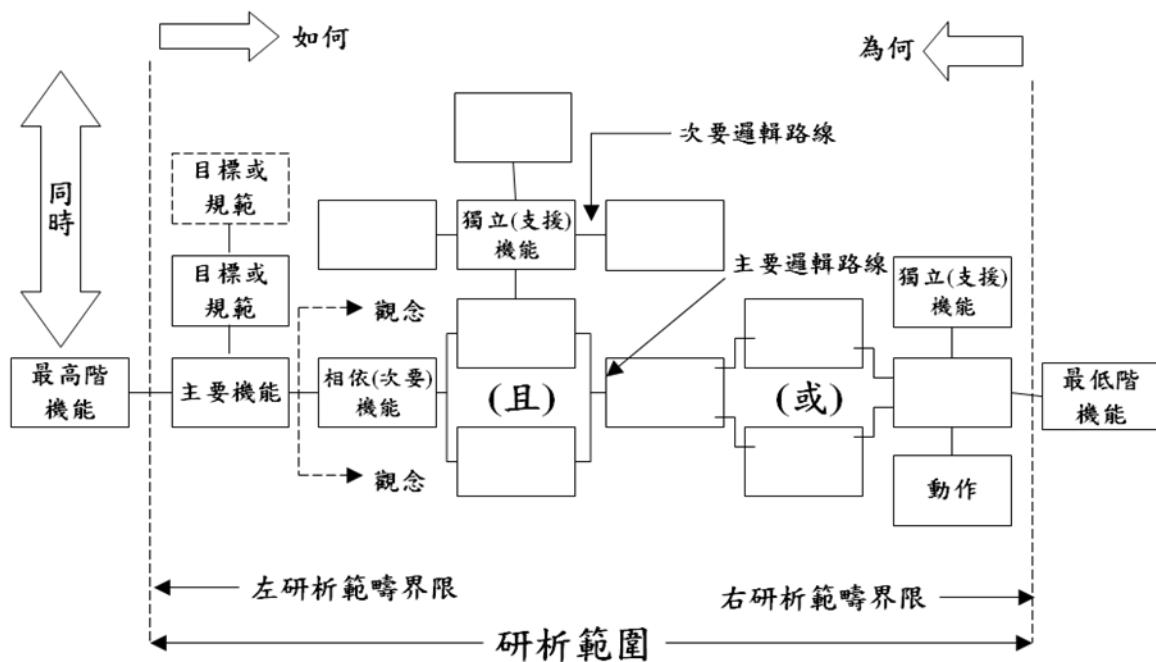
logic pattern based on intuitive logic. The original FAST is referred to as Classic FAST. The second, known as Technical FAST, was developed to separate functions occur only one time, and those "all the time" functions that are active whether the system is operative or not. These "all the time" functions are shown separately from the main function logic. The third and latest, User/Customer FAST, is always headed by four supporting functions, Assure Convenience, Satisfy User, Assure Dependability and Attract User.

機能系統圖 (FAST, Function Analysis Systems Technique) 是一種技術，它係基於直覺的「如何-為甚麼」邏輯概念，將特定計畫中的所有機能的關聯起來。原始的機能系統圖稱為傳統的機能系統圖(Classic FAST)。第二類被稱為技術性的機能系統圖(Technical FAST)，將只發生一次的機能(one time function)及長時間活躍於系統的所有的時間機能(all the time function)從主邏輯機能上單獨列示出來。第三類也是最新者，為使用者/顧客機能系統圖(User/Customer FAST)，由四個主要的配套機能導引出其他機能，分別為：確保方便(Assure Convenience)，滿足使用者(Satisfy User)，確保可靠性(Assure Dependability)和吸引使用者(Attract User)。

The following pages illustrate the format and labeling of the three types of FAST diagrams.

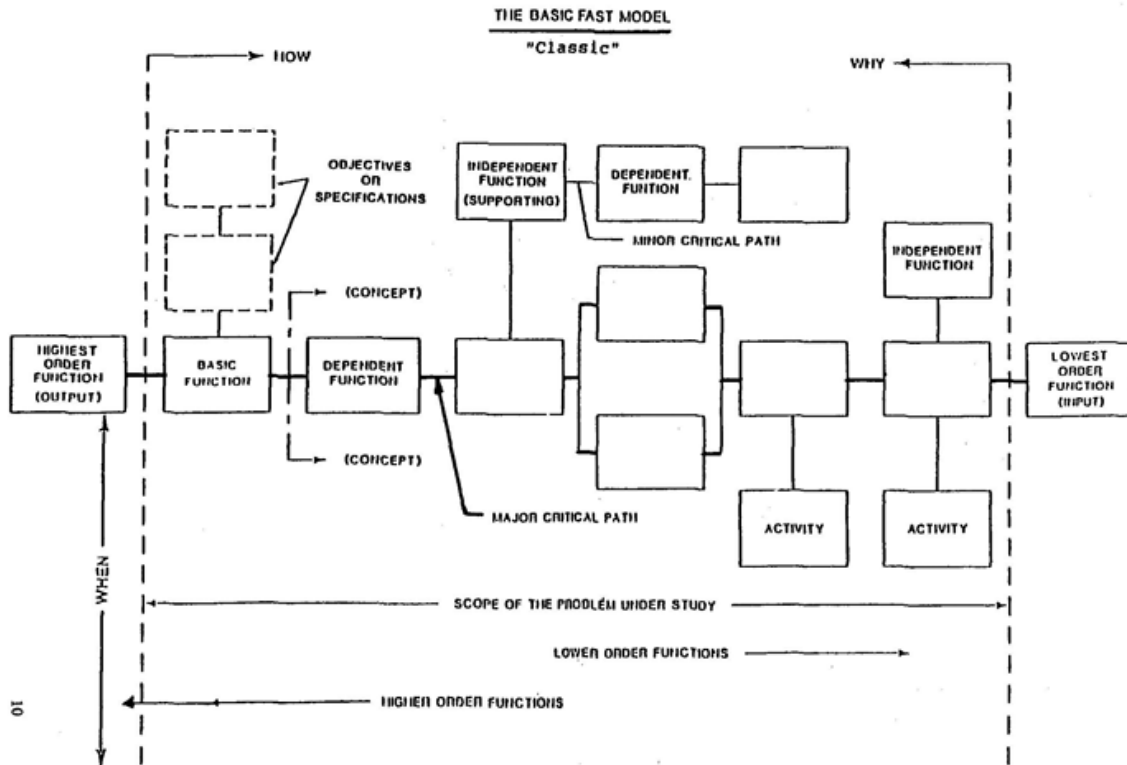
以下幾頁說明三種類型的機能系統圖的格式和標示。

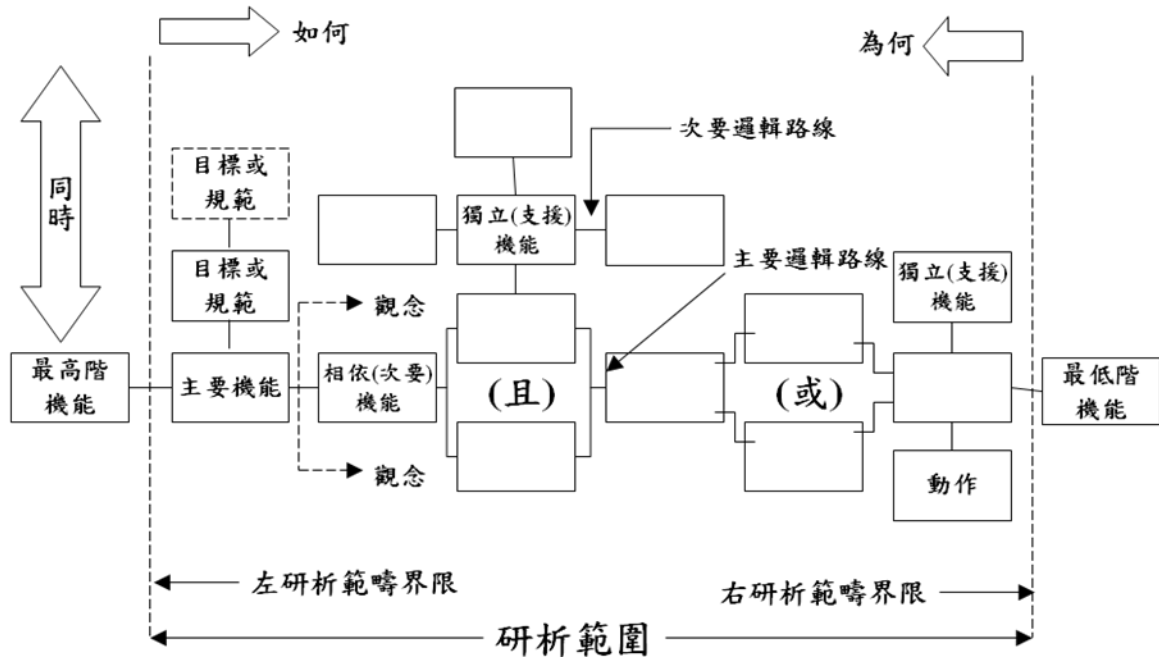




傳統類型的機能系統圖

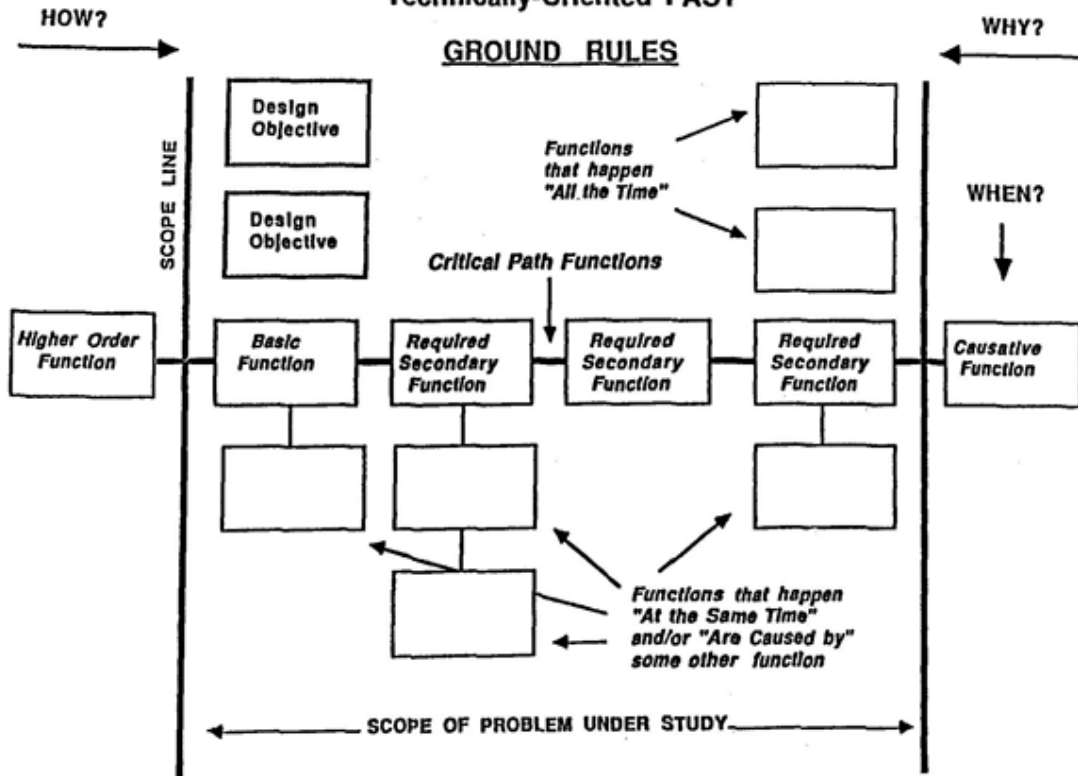
(註：與 SAVE 原圖不完全相同)

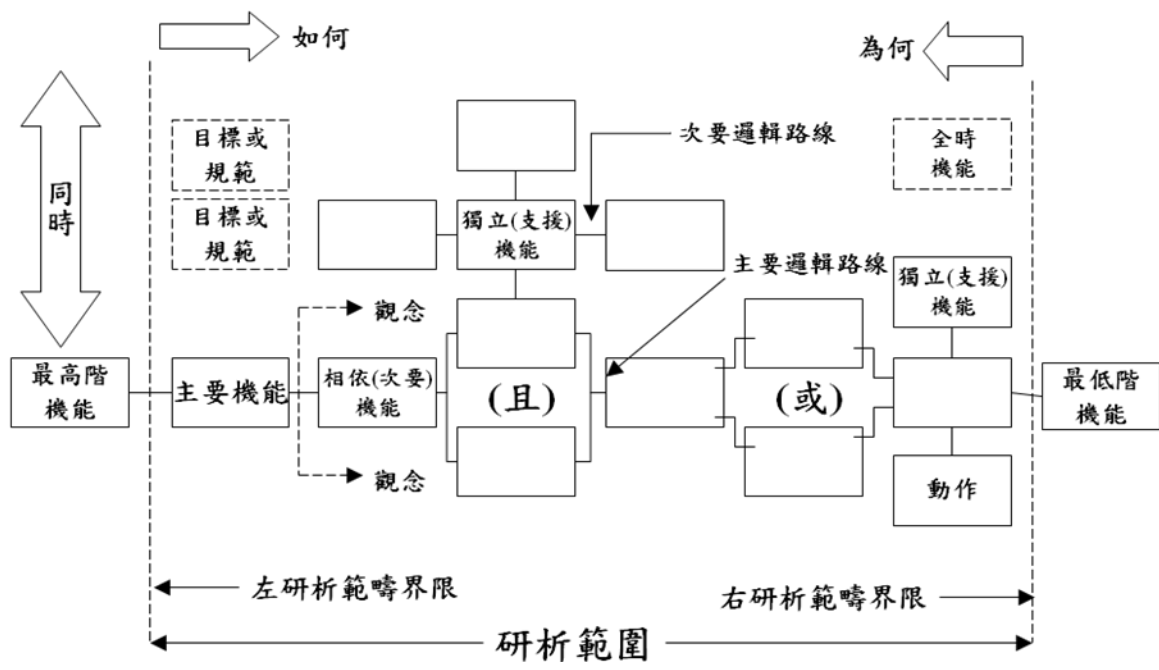




傳統類型的機能系統圖
 (註：與 SAVE 原圖不完全相同)

FUNCTION ANALYSIS SYSTEMS TECHNIQUE
Technically-Oriented FAST



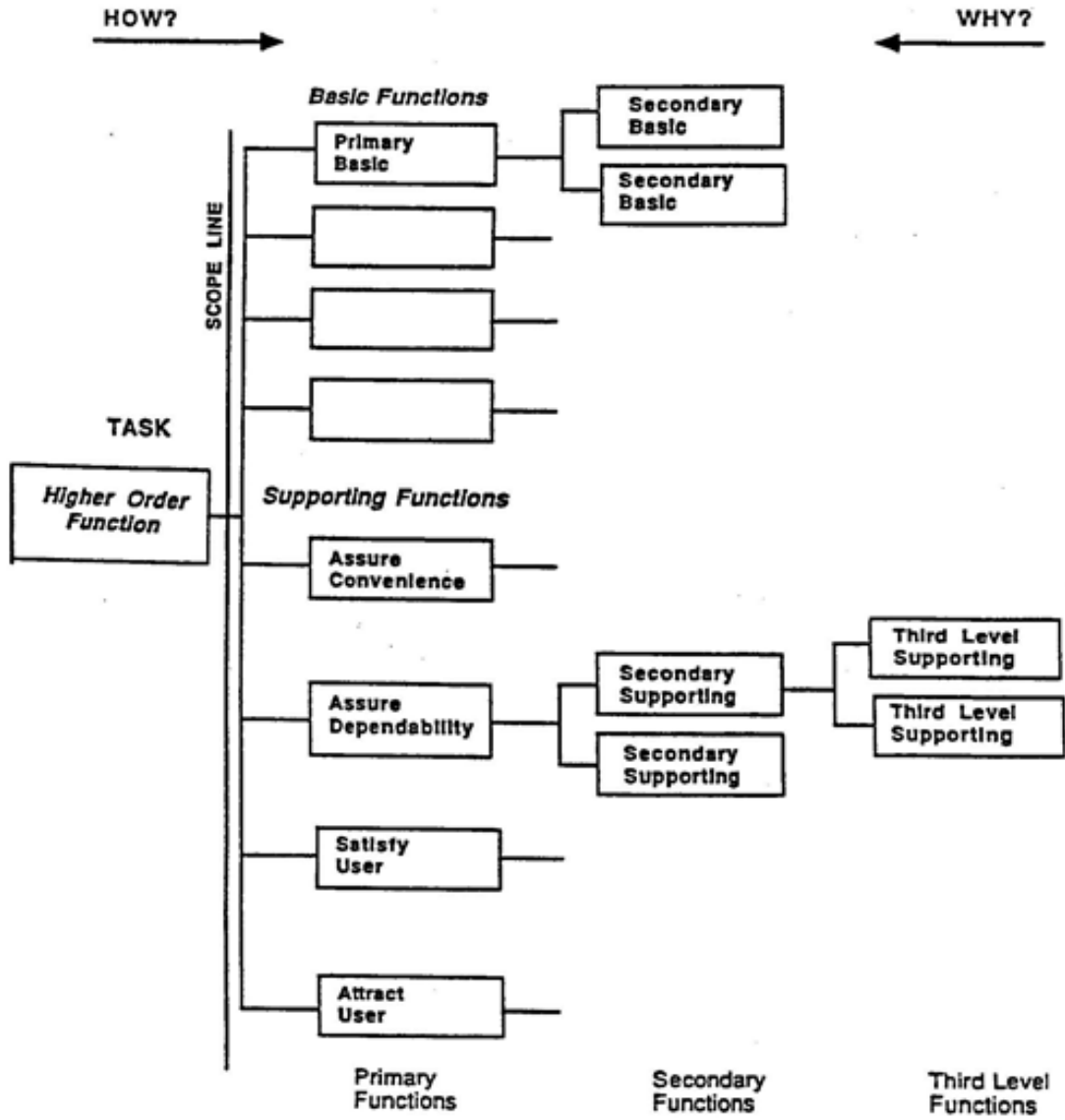


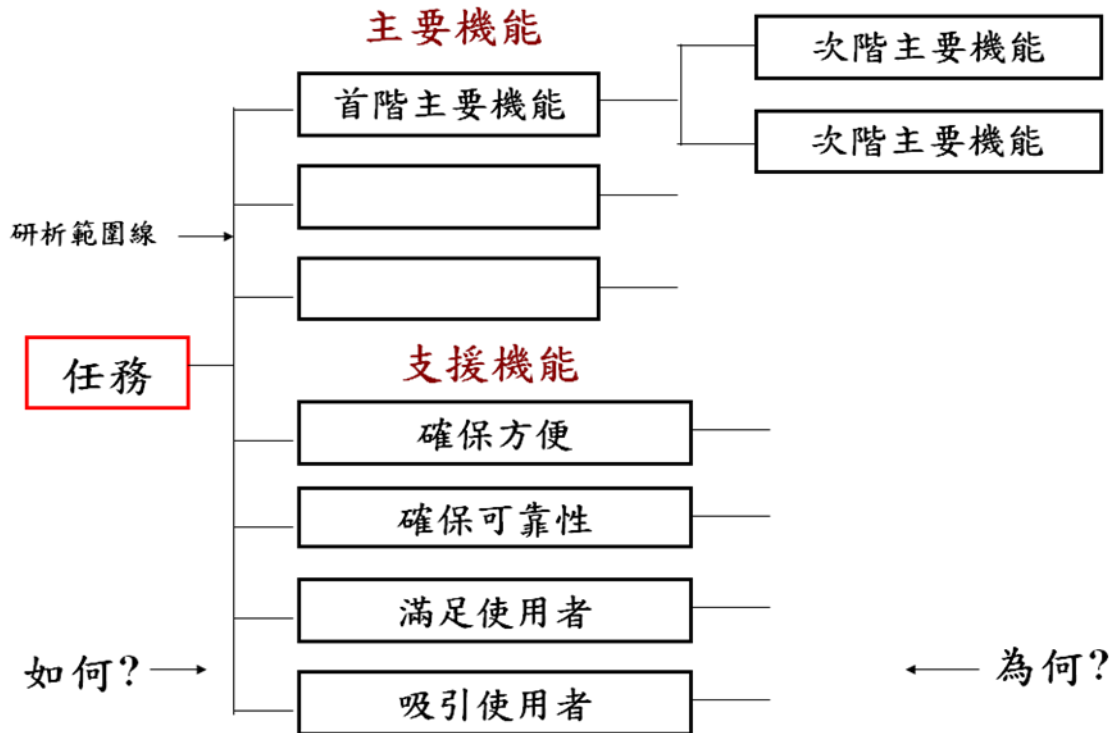
技術類型的機能系統圖

(註：與 SAVE 原圖不完全相同)

FUNCTION ANALYSIS SYSTEMS TECHNIQUE

Customer-Oriented Fast





使用者/顧客類型的機能系統圖

(註：與 SAVE 原圖不完全相同)

Appendix B – What is an Essay?

附錄 B – 何謂申論題？

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Introduction: Statement of Thesis

B-1 引言：論文的說明

Essays like paragraphs develop one main idea. The main idea of an essay is called a *thesis statement*, and it is expressed in the introduction, usually at the end of the introduction. Like the main idea of a paragraph, a thesis is a general statement. The statement that serves as a thesis for an essay is often more general than the topic sentence of a paragraph but not as general as a thesis of a book.

申論題像是在文章各段落中發展一個主要思想，而這申論題的主要思想即是一篇論文的說明，並在引言中加以闡明，且通常是在引言的結束加以表達。這就像一個段落的中心思想，論文是一個通用的說明。而申論題的論文中心思想說明通常比一個段落的主題句更為廣泛，但並不像一本論文書籍般。

An *introduction* serves as a contract between a writer and his or her readers. In the introduction, a writer makes specific commitments that must be fulfilled. The most important of these is the thesis statement, which commits the writer to a specific focus. In effect, it provides the reader with an accurate expectation of what the writer plans to do – the main idea that the writer plans to develop.

引言作為作者與讀者間溝通的合同。在引言中，作者提出必須滿足讀者的具體承諾，而這承諾闡述在最重要的論文說明中，承諾一個特定的焦點，實際上，它提供讀者可以準確的期待- 即作者計畫發展的主要思路。

In general, a good introduction accomplishes three purposes:

1. It attracts the reader's interest,
2. It provides the reader with background definition,
3. It focuses the reader's attention on the main idea of the essay.

在一般情況下，一個很好的引言必需達到下面三個目的：

1. 它吸引讀者的興趣，
2. 它提供了讀者題目的背景定義，
3. 將讀者的注意力集中在文章的主要思想。

Body: Development of Thesis

B-2 主文：論文的發展

The body of a unified coherent essay consists of a number of related paragraphs that develop the thesis.

一個完整連貫的申論題的主文係由許多相關的段落發展為論文。

The individual sentences within each paragraph support the main idea (topic sentence) of the paragraph and the paragraphs support the main idea (thesis) of the essay.

各段落中的個別句子支持該段落的中心思想（主題句），而這些段落支持申論題的主要思想（論文）。

A writer develops the topic sentence of a paragraph by discussing, explaining and expanding the idea that it expresses. A writer develops the thesis of an essay in the same way. Both topic sentences and thesis statements are general statements that must be supported by specific facts, details, and examples. In an essay, a writer usually devotes a paragraph to each major supporting point. Each of these supporting points is directly related to the thesis and helps develop it. But each major supporting point is also developed individually as a paragraph.

一個作者通過討論，解釋和擴充，將想表達的意念發展為一個段落的主題句。亦以同樣的方式發展一篇申論題的論文。不論主題句或論文說明必須由具體的事實、細節和例子來支持其論述。在申論題中，作者通常將每個段落致力於闡述一款主要支撐論點，而每個支撐論點則是直接與論文相關聯且協助發展其論文。但是，每一個主要論點也分別發展成為一個各別的段落。

Writers often develop the paragraphs that make up the body of an essay by using the familiar methods of development – narration, description, illustration, comparison/contrast, classification, cause and effect, and definition. Although

sometimes you may use a single method for an entire essay, it is much more likely that you will use a combination of methods.

作者往往透過下列幾種熟悉的方法來發展段落，構成一篇申論題的主文- 敘述、描寫、說明、比較/對比、分類、因果和定義。雖然有時你可以使用一個單一的方法來完成整個文章，但多數時候你將使用多種方法結合而成。

Conclusion: Re-emphasis of Thesis

B-3 結論：論文的再強調

The conclusion of an essay, like the conclusion of a paragraph, gives the reader a sense of completion. Conclusions usually refer back to the introduction or, at least re-emphasize in some way the thesis stated in the introduction. Often the conclusion briefly summarizes the thesis and the major supporting points. A good conclusion always confirms the audience's understanding of what they have read by reminding them of the writer's purpose. Like introductions, conclusions provide readers with an overview.

一篇申論題的結論，就像一個段落的結束，給讀者完成的感覺。結論通常是指回去介紹，至少再次強調以某種方式引進的論文。通常情況下，結論一般會參照回簡介或再次強調簡介中闡明事項，並重點摘要申論題中的主要支撐點。一個好的結論總是可以加強讀者的認知與提醒作者的闡述目的，就如簡介，結論提供讀者一個申論題的概貌。

Adapted from contexts: Writing and Reading by Jeanette Harris and Ann Mosley

摘錄至：Jeanette Harris and Ann Mosley 著作的『Writing and Reading』