

**A New Method of Management Creating the View of Value and Procedure
among People Concerned**

ADVANCED PROJECT MANAGEMENT METHODOLOGY

**with Method for Changing Knowledge to Wisdom
in Wisdom Management Era**

Methodology of

DTCN/ DTC : Design to Customers' Needs/Design to Cost

Michihiko Esaki, Ph.D.

Professor

**Graduate School of Business Administration, Asahi University
Information Administration Science, Project Management Lab.**

with CD-ROM of whole contents

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Michihiko Esaki, Ph.D.

Professor : Graduate School of Business Administration, Asahi University Information Administration Science, Project Management Lab.

E-mail: esaki@dten-wisdom.jp Home page: <http://dten-wisdom.jp>

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Suite #345, 38705 Seven Mile Road, Livonia, MI 48152, United States of America

Telephone (734)-464-1395, Fax (734)-464-1399

Web site: www.asiusa.com/ E-mai: Shin Taguchi shin.taguchi@asiusa.com

European Contact (Paris) E-mail : Takehiko Abe abe.takehiko@neuf.fr

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To Mutsuko Esaki, my wife

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Acknowledgments regarding the Doctoral Dissertation

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Preface to the English Edition

Another name for this methodology is “the DTCN/DTC (Design to Customers’ Needs/Design to Cost) Methodology” or “Wisdom Management Methodology with Wisdom Engine.”

This book is a book of methodology, which produces a creative and active ‘soul and spirit’ of creative management in an organization or person.

In this book, the word of methodology means “Way of Thinking and its procedure for any theme or subject.”

1. Why this book was written

In order to produce a creative and active ‘soul and spirit’ in management or other activities, e.g., for changing Knowledge to Wisdom in an organization or person, the author shares them the information and knowledge of new methodology, which he developed, from 1973 to 2001.

The Japanese Ministry of Education and Science provided a grant-in-aid for the Publication of scientific research to publish this English book.

The author gives the following information to readers all over the world in this book.

Note:

The first Japanese original version of this book was published in 1984 as the New thinking and its procedures for Design to Cost.

The second Japanese version of this book was published in 1997 as the Advanced Project management methodology for Design to Customers’ Needs / Design to Cost by creating the same view of value and procedure among the people concerned.

Methodologies in the third version of this book (2001) include the Method for changing Knowledge to Wisdom as appendix G and other author’s new methodologies, which were developed since the publication of the original book in 1997 in Japan.

2. What is included in this book?

- (1) An understanding of the “Decision Mechanism by Information of Difference” which is usually done unconsciously.
- (2) A visible method by which we can:
 - a. create or show a direction of value or a consensus among the people concerned (including ourselves), using a vertical form of repeating “in order to do XX, how to do YY” from top down on paper.

b. focus on and grasp the most appropriate expression level of “Must do” in order to reach the objective result as “ the main key word expression.”

c. grasp “the entrance key word expression,” which is where we have to start in order to realize the objective result of the main key word level.

This method is called “PMD (purpose-measure-diagram)” or “the method of key word.”

(3) A visible method to create the faultless phased procedures in the series of logical events to realize the objective result to the extent physically feasible.

This method is called “Steplist and 3-5 Phase Improvement Method.”

(4) A method to create the things or system structures of objective results which we want to have.

This method is called the FBS (Function Breakdown Structure) technique.”

(5) A method to rearrange an the organization in order to start new things, providing improvements over the conventional committee and task theme team system to prevent the hindrance of progress.

This method is called “the Root binding method.”

(6) A method of making an effective implementation plan document by combining the above method, in order to realize the objective results effectively.

This method is called “Implementation plan document method.”

(7) A method of adding cost factor and using the above methods:

a. furthers the targeted cost and performance design during the development and design phase.

b. reduces costs during production, logistics and operation phase.

c. creates new customers’ needs and their markets.

d. also creates ideas to improve the quality of things and processes by combining and supplementing conventional quality improvement method (e.g. QFD and TQC).

This method is called “DTCN/DTC Methodology.”

(8) The method to create new thinking and an idea exchange idea place to creatively work together with people in engineering, accounting and management, and others.

This method is called the “Engineering Accounting method.”

(9) Based on the above methodologies, this book introduces the method for changing knowledge to wisdom with a wisdom engine for the first time in the world.

(10) This book also introduces the minimum and effective knowledge and understandings/recognition to proceed with the above methodologies with an accompanying episode which relates to a new area of applied psychology.

3. What function and benefits a reader can get through this book.

The following are the examples:

(1) When you are uncertain of where you can start ;

a. make a PMD(Purpose Measure Diagram) using the PMD Method, in the style of vertically ordered expressions in the sense of repeating “in order to do XX, it is necessary to do YY.”

b. then, you can grasp the expressions of the upper abstracted purpose levels, at the implement key word level and entrance key word level, where you start.

This diagram shows the direction of value of what you are going to do.

c. Understanding this direction of value, you can make a faultless phased procedure in the sense of having phased input and output with assurance activities and conditions between them using the “Steplist Format” in this book.

(2) There are many conventional and new methodologies.

But many people don't know what and how phased preparation is necessary to use them effectively and appropriately.

You can allocate these methodologies depending upon the direction of value which you are going to effect using the “PMD method” and “Steplist method.

In order to effectively use any tool, method or methodology, it is necessary to have the most appropriately prepared input materials or information beforehand.

“Steplist and 3-5 phase improvement” in this book provides this function and effect.

(3) You can solve a problem by doing the above functional activities and by the methods in this book.

(4) The main suggestions to be understood in this book.

a. Replace or raise the problem to subject or theme level expression (what you are going to do at this moment).

b. Replace or re-identify the problem as the conditions expression to realize the objective result of the subject or theme. And make efforts to realize the conditions.

c. Thus, you can get into the creative and active steps to realize the conditions needed in order to realize the objective result.

By doing the above, you can solve or overcome the problem more quickly and in a smarter style than you ever experienced in the past.

Additionally, if you want to do this more precisely, read “Proper use of questioning for creative thinking and decision making” of chapter 1.3 in this book.

(5) The above are to create the procedure or phased procedure to realize the objective result.

Very few conventional methodologies provide a means how to create faultless phased procedures having the direction of value or view of value of subject.

The methodology in this book reveals these methodologies, and gives you the functional thinking and procedural tools and effects to overcome any theme or subject to the extent physically feasible.

(6) The Methodologies in this book provide functional thinking and structuring tools to effectively create the structure of objective results.

They are more visible and comprehensive in style and structure than any other methodology.

(7) Based on the above, the methodologies in this book have the function of integrating and combining together with other methodologies in effective procedures and supplementing other methodologies in terms of creativity, cost, and quality.

4. The structure of the book

In order to explain the above contents, the rough structure of the contents of this book is given below:

- (1) Prologue: The minimum recognition to understand the methodology
- (2) The seven basic methodologies
- (3) Some examples of deploying the basic method to complicated matter.
- (4) Related methodologies
 - (5) Reasonable price and its standards for making decision or reaching agreements between two parties.
 - (6) How to proceed with DTC (Design to Cost) by using DTCN methodology.
 - (7) How to proceed with Design to Cost for unit production cost.
 - (8) How to proceed with Design to Cost for development cost.
 - (9) Future prospects of this methodology as of 1995
 - (10) Acknowledgement regarding the doctoral dissertation
 - (11) Appendix to help the DTCN/DTC methodology and additional methods and methodologies derived from the DTCN/DTC methodology.
 - a. NM method to create the image of an idea from key word (invented by Mr. Masakazu Nakayama)
 - b. Supplemental thinking and methodologies to deploy and complete the objective of DTCN/DTC methodology.
- c. A copy of MIL-STD-499A; engineering management.

This standard has been deleted by the Department of Defense. However, this standard is a very effective tool, if it is tailored as necessary for the development design/testing and evaluation stage of the upper stream phases of the ISO 9000 standard.

 - d. A success story of DTCN/DTC methodology in 1990.
 - e. Examples of implementation plan documents and related effective formats.
 - f. A one page explanation of DTCN and DTC using DTCN methodology.
 - g. A method for changing knowledge into wisdom with a wisdom engine.
 - h. A procedure and visible format for abduction, verification, evaluation and decision making of future

matter and past matter.

- i. A self organized flow chart to create and improve the goods, product, service and market with multi-screen wisdom desk, also combining QFD DTCN/DTC, TRIZ and Taguchi method.
- j. The relationship between QFD, VA/VE, and DTCN/DTC.
- k. The method of management /accounting using reversal positioning of journal format.
(a method to create co-operating thinking and work place among science/engineering and management/accounting people).

5. Special note to proceed with design to cost by using DTCN (Design to Customers' Needs) methodology.

The following are the differences between DOD the U.S. style of design to cost and the Japanese style of design to cost.

- (1) The success level will be greatly affected depending upon whether there is a reward.
- (2) To be successful :
 - ① Use "Design to Cost" in cases without reward money.
 - ② Give only the activity money expense with the implementation plan created by the DTCN/DTC methodology in this book by contract.

This is because, if an award money contract exists, the people concerned in that project on the contractor side will hide good ideas until a lot of award money can be obtained by proposing good idea. However, if a good idea is proposed at later phase, it is possible to cause another problem or trouble from the standpoint of integration, compatibility and re-test and evaluation.

- (3) For a long time, researchers believe that there was a rule, "if cost is reduced, performance must be lowered."

In this sense, they believe that there is a trade-off between cost and performance.

However, we have found many examples where "cost was lowered and performance was kept or increased," after we proceed with design to cost activities with activity expenses paid.

There are very few cases where performance has to be lowered to reduce the cost.

The US paper refers this to "CAIV" or "Cost as Independent Variable."

Preface to Japanese language edition (1997)

I.. Problem Areas in Existing Thinking Methodology and Management Methodology

We believe the following problems remain in the field of scientific management methods.

(1) Among the existing techniques developed to increase management efficiency are engineering methods such as VE (Value Engineering), IE (Industrial Engineering), QC (Quality Control), and Project Management. These should be universally applicable, but in some cases there is a gap.

Isn't there a way of supplementing and appropriately joining all these methods together?

(2) The NM-method invented by Masakazu Nakayama, and the KJ method (affinity-method invented by Jiro Kawakita) are excellent for producing ideas and understanding phenomena, but when it comes to linking them with concrete business, including VE, IE, and QC, there is a gap.

Isn't there a way of appropriately joining together and supplementing all these methods?

(3) Project management is supposed to start from the Gantt chart and WBS (Work Breakdown Structure), but there is no established procedure to create procedures and WBS before the Gantt chart. Isn't there a good way of creating such a procedure?

(4) When developing new products or organizations, or improving cost and performance in industry and government, a wide range of structured Quality Assurance (QA), Quality Control (QC) and Quality Improvement (QI) becomes necessary for the thinking and work processes.

Isn't there a good way to assure that these processes are structurally faultless?

(5) A manager realizing a task must orient the parties concerned in a common direction, generate consensus and motivate them.

Cannot one create a clear measure or procedure for doing these things?

(6) To achieve a concrete target cost or performance, the operation must be divided into steps.

How can these steps be set to achieve a creative faultless rational process and its decision-making?

(7) In the above, there is some confusion between the scientific method and the engineering method, and a proper coexistence is called for. Isn't there a way of appropriately dividing and combining these two

methods?

This book is meant to answer these questions.

II. What are the characteristics of the thinking and procedures appearing in this book?

(1) The purpose of this book is to observe our casual thinking, actions, and patterns of decision-making with regard to their cause and effect, and recreate them in a visible form.

(2) The object may be software, hardware, or a mixture of both.

(3) Using cards, the roles and abilities of the brain are mapped onto paper as purpose and measure. This is hypothetical, but the purpose should reflect the thinking in the forebrain, and the measure, the hindbrain. For concrete creative action and judgment, the direction of value, focus, and entrance key are further fixed on paper. This allows the value creation of a group to take on a visible form.

(4) The left brain, the site of logic and language, and the right brain, the site of experience and image, are alternately and faultlessly collated for creative thought and action. This collation of procedure and image is drawn upon paper.

(5) Therefore, this creates procedures and structured thoughts which were previously only in the realm of concepts. Also, it can be used as a means of thinking or as a way of observing natural phenomena which were previously only in the realm of concepts.

(6) Through this, creative methods, management methods, and measures developed by our predecessors and ourselves can be reconsidered, supplemented, and combined according to the purpose.

(7) Also, we may clarify the usage of words and their relationship, which were ambiguous before.

(8) Based on the above, Design To Cost, which was previously only in the realm of concepts and policy, was made into a procedure by the author in 1976. This made target design possible.

(9) After the Thinking and Its Procedure for Design to Cost (DTC Method) was established and put to

practical use, the Method of Design To Customers' Needs was established. These two methods were combined into a further general technique, which constitutes the content of this book.

III. How the Japanese version of this book was published

The first publication, which is the basis of this book, was a booklet "A New Way of Thinking and Procedure for Design to Cost" published by the Sanno-Daigaku Publishing Co. in 1984. The author was working for the Kawasaki Heavy Ind. Co. Ltd. and publication was requested by the NASDA (National Space Development Agency of Japan).

In those days, copying machines did not have magnification functions, and it was necessary to set the format at the end as A3 or A4. The publishing company was of the opinion that the book size should be B5 to place it side by side with other books on the bookshelves of book stores; otherwise the book wouldn't sell. However, priority was set on the practical use of the format and its copying, resulting in an A4 edition. Consequently, the first book was on the shelves for only a brief while, and not many people had a chance to read it. This book then was published after the following process:

1. Acknowledgment of copyright to the author when he retired from Kawasaki Heavy Ind. Co. Ltd.
2. Request from Defense Agency executives to leave the techniques contained in the book as collective know-how.
3. After retirement, entrance of the author into the Tokyo Institute of Technology Graduate School Adult Program Doctoral Course, 1 year and 3 months of putting together the material into a thesis, fulfilling the Doctoral Course requirements, and receiving a Doctorate.
4. Two years as Professor at the Post Graduate School of Business Administration, Asahi University, Information Administration Science, Project Management Laboratory, the material was adapted as an educational reference.
5. The publication of the Japanese version was backed by the Miyata Fund of Asahi University and Kazuhiko Nishi of Ascii, Co.
6. The English translation was backed by "Grant-in-aid for publication of scientific research results" of the Ministry of Education of Japan.

Following the above, the book saw publication.

IV. The Application and Structure of this book

1. Applications

This book is for people who wish to use the methods (thinking and procedures) set herein.

Based on its practical success, the material was submitted as a thesis in 1993 at the Tokyo Institute of Technology, Science and Technology Department, Management Technology Doctoral Course. Further commentary and supplementary material were added to make the book easy to read and useful as a manual in actual business.

I hope new applications will be forthcoming from people who read and use the book.

Note: This book is also a supplement to *Aerospace Engineering Handbook*, Chap. A9, "Development Management," edited and published by the Aerospace Engineering Society of Japan (Maruzen 1992).

2. A summary of the methods in the book

1. Our methods are creative management methods which start by setting the same view of value among the people concerned (including the customer), and can be used in research, development, and materialization of the objective as well as in the improvement of daily business.

Note: The definition of the term "view of value" is given in "View of value by PMD," item 3.1.3(5) in this book.

Our method/methodology consists of the Methodology of DTCN (Design to Customers' Needs) and the Method of Design to Cost (DTC) using the DTCN methodology. Our methods are compatible and complementary with existing techniques (IE, VE, QC, QFD, TAGUCHI, KJ, NM etc.). Using our methods, where and how the latter ought to be used are clarified as input-output relations. In particular the Method of Design to Cost (DTC) has economic realization as its goal. In the development stage of something, performance, cost, quality, and scheduling are treated as management elements at an equal level, and their targets are set. This method creates specific procedures and follow-up mechanisms to realize the targets within a reasonable range.

The development of these methods began in 1974, and they have been used in several official projects since 1981. Recently, based on these methods, further application methods have been developed and put into practice.

2. The Structure of DTCN Methodology and the Method of DTC using DTCN Methodology

The structure of DTCN/DTC thinking and procedures (DTC Methodology can be used independently) is shown in Fig. 0-1. We explain the contents following the box numbers in Fig. 0-1.

(1) Understanding and policy

01. Decision Mechanism by Information of Difference

– analysis of the decision mechanism, and thinking and knowledge for their appropriate use

02. Proper Use of “In order to,” “How to,” and “Why” Questions

– thinking and knowledge for aligning the vectors of creative thought and action

03. Thinking and Policy of DTCN

– policy to create social significance for the results created by the methods

(2) The 7 Basic Methods of DTCN and Supplementary methods

1. PMD (Purpose-Measure Diagram) Method (a.k.a., the Method of Key Word)

Using this method, parties with a given theme do the following:

- a. Create a relation between purpose and measure (direction of value). (This applies particularly to something without precedent.)
- b. Grasp the appropriate "Main Key Word." (verb and noun expression of the objective with minimum of adjective and/or adverb)
- c. Clarify where to start from in order to achieve the desired result (Entrance Key Word)

Using the above, the parties concerned come to have a common direction of value. Incidentally, there are two types of PMD method, "Theme PMD (1A)," a search for an expression for the appropriate task or theme/subject, and "Action PMD (1B)," a search for a Key Word in the form “Do something” for that task.

2. Steplist Management

Using this method, a procedure is created for a phased and faultless operation, and decision-making.

3. 3-5 Phase Improvement

Using this method, the improvement approach pattern from the present state can be divided into 3 or 5 stages, and balanced improvement and development becomes possible.

4. FBS/WBS Technique (FBS: Function Breakdown Structure, WBS: Work Breakdown Structure)

Using this method, the optimal image structure of the desired result is created.

5. WBS Theme Phasing Technique

Using this method, the themes/ideas which are worthy of consideration in realizing the intended result are gathered from the people concerned and examined in appropriate stages.

6. Root Organizing (RO) Method

Using this method, root organizing is performed, and a procedure to materialize new things within the organization is created and operated.

7. Making of the Implementation Plan Document and the method for its execution

Following the policy of DTCN and using methods 1, 2, 3, 4, 5, and 6 above, the head of an organization approves the necessary procedures as the Implementation Plan Document, and follows up the planned procedure and its contents in an implementation plan.

8. Supplementary methods to the 7 Basic Methods of DTCN

The methods below are used as supplements to the 7 basic methods of DTCN as necessary.

8A. WBS (Re-definition)

A method of redefining the concept of Work Breakdown Structure, and making it easier to use.

8B. WBS in Moebius-Style

A method which creates an entrance and exit for the "chicken or egg" type loops which frequently arise in the early design stage, and spontaneously creates a rational examination process.

8C. Pre-evaluation and Structuring Method from a Rational Perspective

A pre-evaluation method of rational comparison to practically weigh the structure and elements of the objects being compared.

(3) DTC Methods

When target values regarding cost, performance, scheduling, quality and so on must be realized reasonably, the following thinking, standards, and methods are added to the DTCN method, and Design To Cost (DTC) is performed.

9. Knowledge and Cost Management Flow Chart of the Company

Management cycle of know-how and cost to be observed so that companies fulfill their social mission. This should underlie DTC.

10. Reasonable Price and Its Standard

10A. Steplist for Reasonable Price

Shows how a reasonable price is arrived at.

10B. Price and Cost Breakdown Table for Cost Control

Provides a map for appropriate and reasonable cost control

10C. Decision Standard for Price

Enumeration of knowledge and information when setting the price.

11. Common Procedures of DTC

11A. Minimum knowledge to proceed with DTC.

11B. Essential conditions to proceed with DTC.

12. DTC for Unit Production Cost

- This includes DTC for lifecycle cost
- Procedures to realize target of unit production cost during development which have been difficult with conventional methods.

13. DTC for Developing Cost

This shows the difference between the DTC procedures for unit production costs, and how to do DTC for developing cost.

3. Purpose-Measure Relationship of the 7 Basic Methods of DTCN

The purpose-measure relationship of the 7 basic methods of DTCN is shown in Fig. 0-2.

In short, the DTCN method starts from a theme or subject. If the theme or subject is unclear, one can start after the theme or subject is clarified by the KJ method or Theme PMD method.

(Note: Usually the theme-PMD method is sufficient for clarifying the matter. If a problem is unsolvable, it may be switched to a theme, which allows the application of the DTCN method. Sometimes, switching a problem to a theme or subject is sufficient to make the problem vanish, and to show how the theme can be

realized.)

However, if a procedure in the present stage of the realization of the theme or subject cannot be linked via a rational story, and such a PMD and Steplist cannot be created, this means that the theme or subject cannot be realized. This method thus allows for the discrimination between things which can be realized and things which can not.

4. Applications of the DTCN/DTC method

The DTCN/DTC method can also be used as follows:

(1) In daily business, a problem or theme which provides no clue as to where or how to seek a solution may arise. In such a case, this method can create an action procedure through individual or collective ingenuity to the extent allowed by the laws of physics and chemistry.

(2) To supplement the existing IE, VE, and QC methods, and allow for a more effective use of them. According to the purpose of the project, these methods can be allocated to the most appropriate step in the input-output relation in order to achieve the objective.

Note: A brief summary of each method.

IE method: method to increase the efficiency of the operation, starting with "What is the problem?"

VE method: method to increase effect through selection of measures to realize functions, starting with "What is it?"

DTCN method: method of mission realization, starting with "What is the theme?" and the Purpose-Measure Diagram

DTC method: an application of DTCN which sets a target cost by adding the consideration of cost to DTCN method.

(3) A method and measure which can realize, by actual procedures, what was hitherto in the realm of policy or concept.

(4) The use of QC methods alone for existing small group activities in the sales, development, and design departments will result in a limit. Therefore, the DTCN/DTC method may be used as a supplement or alternative. (The use of PMD, 3-5 improvement, or steplist may be sufficient.)

-5. Other applications

See Table 0.1 “Cases where the DTCN/DTC method can be used as an effective tool”

-6. Items to note when considering the introduction of DTCN/DTC

- The essential condition is to make a PMD and steplist on a difficult theme once or twice. This allows the structure and procedure of thinking and action to be cleared of matters which appear to be understood, but are not properly so. One then understands what the target should be, how to reach it, and where and how to start.

- Hence, if the PMD and steplist are prepared, relevant laws are clarified and can be visualized. As a result, the procedures necessary to achieve the target can be recognized on oneself and by the group. Thus, everyone is prepared for action and realization.

Another item to note is that the PMD and steplists of others may not look impressive. The PMD and steplist have to be made by oneself. The skill of riding a bicycle can be acquired only by riding a bicycle oneself, not by studying it from a book or by only hearing about it. The same principle applies here.

VI. The Purpose Measure Relationship of the DTCN/DTC Methodology:

Read figure 02 from top to down repeating “In order to do AA, it is necessary to do BB.”

Fig 0.1 Structure of DTCN/DTC thinking and its procedures (DTCN methodology can be used independently)

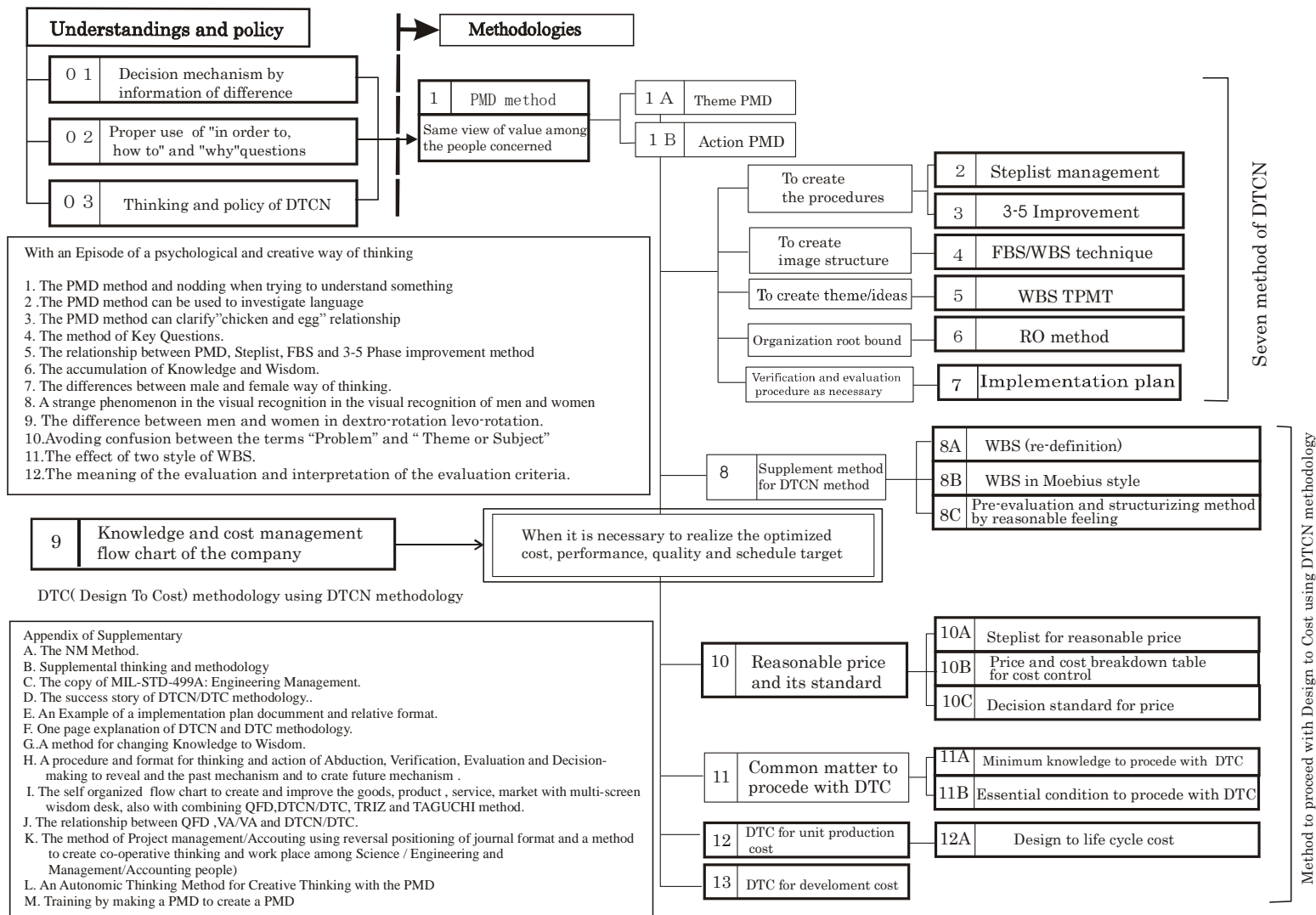


Table 0-1 Cases where the DTCN/DTC method can be used as an effective tool.

1. For people in charge of planning

- (1) To plan new products and products which sell
- (2) To prepare a program planning document
 - To create a new sense of value
 - To appropriately phase development programs
- (3) Phased decision-making for program planning and development: Creating a framework and an implementation plan.
- (4) To judge the prospect of securing a reasonable and appropriate profit when materializing a plan. (If prospects are poor, the plan may be aborted at an early stage through the phased decision-making.)

2. For people in charge of Total Quality Control (TQC)/Total Quality Management (TQM)

- (1) To create a sense of value among the parties concerned
- (2) To direct decision-making
- (3) To motivate (can be either top-down or bottom-up)
- (4) To supplement and unify existing methods in TQC and TQM
- (5) To extend TQC to TQM with respect to perspective and methodology

3. For people in charge of design

- (1) To find how and where to start from" when they are unclear in the beginning stages
- (2) To create organized design ideas and select the appropriate one
- (3) To select candidate parts and dealers
- (4) To establish a common wavelength with parts dealers; to proceed with hierarchical management control with dealers in the design and development phases.
- (5) To gather the theme and ideas from the parties involved, and examine them in a timely manner

4. For people in charge of constructing information systems

- (1) To use when faced with a difficult software problem, and when where and how to proceed are unclear.
- (2) To update the idea and image structure of large-scale software from time to time

- (3) To get the view of value and accompanying database accumulation
 - (4) To create a support system for decision-making
 - (5) To create future artificial intelligence (AI) algorithms
 - (6) To create the frame and content of a new integrated software
 - (7) To decide on procedures for complex programming
5. For people in charge of production technology (IE, CIM, FA, process planning)
- (1) To achieve consensus with the aim of making a new process or improving an existing one
 - (2) To proceed with Plan to Cost
 - (3) To execute Production to Cost
 - (4) To achieve consistency between present processes and future process plans
6. For people in charge of procurement
- (1) To clarify the conceptual setting and definition of reasonable price
 - (2) To decide on a reasonable price
 - (3) To identify the possible lowest price when reducing costs
 - (4) To present reasonable terms and conditions to estimate cost
 - (5) To acquire estimation, decide on price, place orders, evaluate results, and determine payment for phased development
7. For people in charge of reducing costs
- (1) To create a framework and system for cost reduction plans
 - (2) To come up with ideas, evaluate them, and realize them.
 - (3) To determine priorities for materializing the cost reduction
 - (4) To allocate which cost reduction method to use in which phase
 - (5) To probe the limits of cost reduction
8. For people in charge of business activities
- (1) To create markets
 - Determine the planning, program, and execution procedures for market creation
 - Focus in on the market creation area, and fix a target for its materialization

- (2) To convert user needs to product needs/seeds
 - (3) To assign roles within the department to involve the user in the development process
 - (4) To highlight the needs which users themselves could not give expression to
 - (5) To using the above, to take action to improve sales
9. For people in charge of Value Engineering (VE) and its improvement
- (1) To supplement VE methodology (The determination of basic functional expressions is particularly clear with PMD method of DTCN methodology)
 - (2) To classify improvements as “as soon as possible”, “urgent”, and “optimal”, and realize them
 - (3) To materialize VE or its improvement to the end (conventional VE only proposes the idea to be realized)
10. For people in charge of quality control
- (1) To clarify the relationship between QA, QC, QI (Quality Improvement) and inspection
 - (2) To prepare to extend quality control assurance activities to the upstream of planning and design, and actualize them.
 - (3) To clarify the pre- and post- assurance activities necessary to ensure product quality.
 - (4) To assure coexistence and efficient functioning of problem-solving-type and theme-realization-type quality control
11. For people in charge of development planning and management
- (1) To create the same direction of value among the people concerned and make an action plan for joint development
 - (2) To make the implementation plan for joint development
12. For people in charge of the budget or audit
- (1) To produce material and plans on the applicant side when drawing up the budget of a large-scale project
 - (2) To create the same direction of value between the person in charge of the project and the person who evaluates from the outside before the start of the project by:
 - Making and establishing “evaluation standards” for each phase of a large-scale project in advance

so that its validity is ensured.

- Preparing a phased mechanism for stopping or suspending a large-scale project if a major problem is foreseen during its course.

13. For people in charge of research in behavioral sciences

(1) To apply the decision-making mechanism clarified in this book to various fields in behavioral science

(2) To decide on the basic posture and pattern for observation

(3) To identify sexual differences in thinking and action patterns

(4) To clarify the content of sensitivity as much as possible, and extend it creatively

14. For people in charge of management/system engineering

(1) To relate, supplement, and join existing methodologies, such as IE, VE, and QC.

(2) To assign various methodologies such as IE, VE, QC to the appropriate phase of a project

(3) To combine and use Japanese methodologies (KJ, NM, QFD, Taguchi Method) with foreign ones

(4) To produce the above as computer software, and make it available for large-scale systems.

15. For people in charge of improving international relations

(1) To fill in the perception gap between different nations

(2) To create the same direction of value in international operations

(3) To clarify and set procedural priorities on what should be done and what can be done.

16. For people in charge of language studies

(1) To create new words or expressions

(2) To clarify the relation between meaning and significance, etc.

(3) To clarify the relation (algorithm, definition, etc.) between natural language and language of meaning

(4) To Create grammar of thinking and procedure from a new point of view

17. For legislators, congressmen and administrators

(1) To remove walls between departments, and create new forms of administration, e.g.,

improvement of emergency medical systems

- (2) To appropriately interpret and apply laws, regulations, etc.
- (3) To review laws and regulations
- (4) To achieve public consensus on new operations

18. For people in charge of international joint development

- (1) To make a bargain scenario in international joint development (the exchange of “offer” and “acceptance”)
- (2) To create the same direction value among parties concerned before starting international joint development
- (3) To fill in the perception gaps which are generated during international joint development
- (4) To create an implementation plan document for international joint development

19. For people specializing in philosophy, logic etc.

- (1) To add new thinking and procedures to existing disciplines

20. For people trying to proceed with re-engineering

- (1) To discover which processes should be subject to re-engineering (BPR)
- (2) To create a development procedure for which processes to realize
- (3) To maintain and review the completed processes

21. For companies acquiring ISO9000 and ISO14000 certifications

- (1) To create an implementation plan for effectively and efficiently acquiring ISO9000 and ISO14000
- (2) To develop processes which match ISO9000 and ISO14000, and faultless compact forms to be used there
- (3) To make a system which can be maintained and reviewed after acquisition

22. For groups wanting to develop CALS (Continuous Acquisition and Lifecycle Support)

- (1) To structure purpose-measure relationships in CALS components and activities
- (2) To weave the system of development, interface, operation and logistics, and disposal into the

CALS structure

- (3) To use a tool to develop applications of CALS

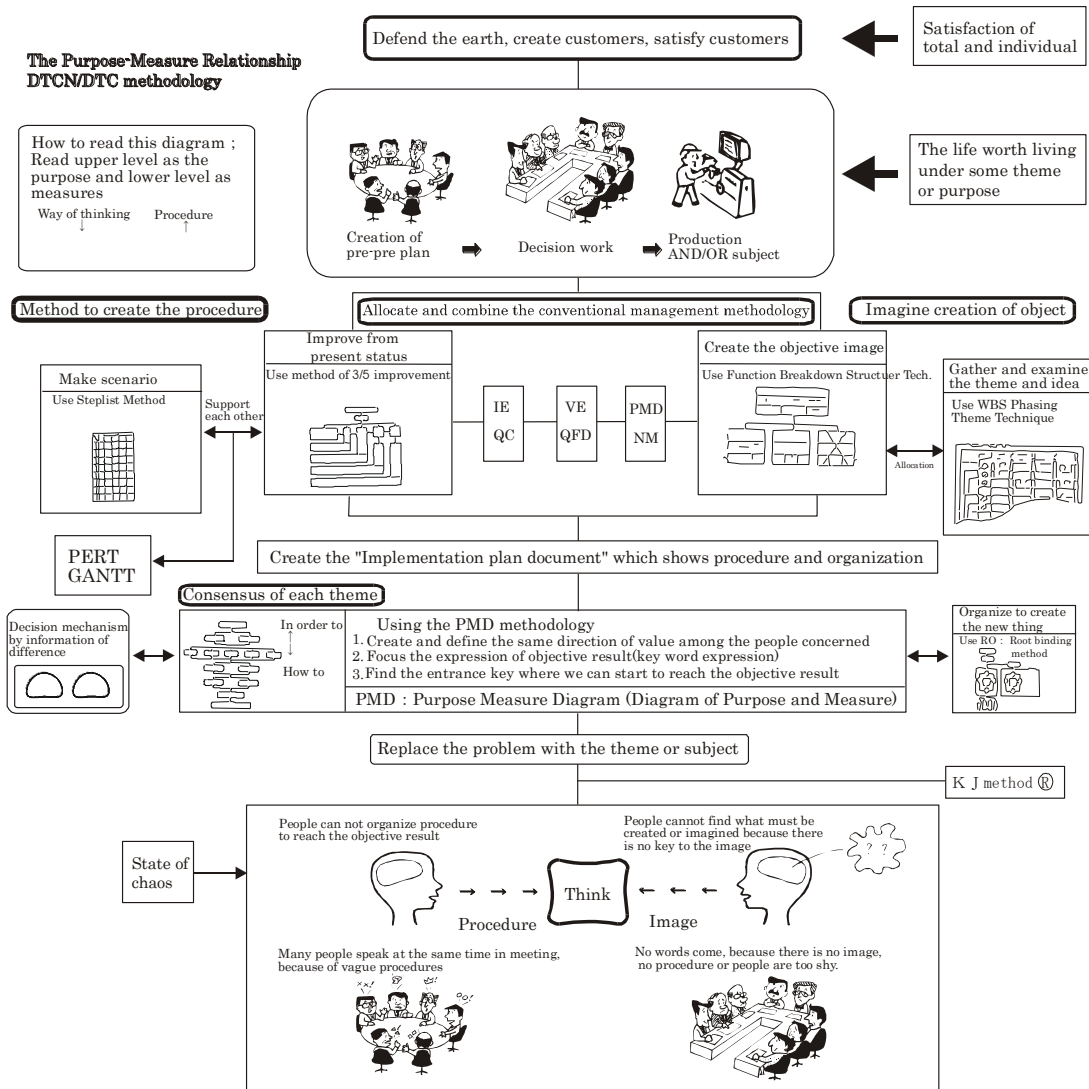
23. For people in charge of education (elementary school to university)

- (1) To use a tool for improving the creativity and concentration of elementary school and junior high school students

- (2) To use a tool for high school students facing university entrance examinations

- (3) For university students, to write thesis and acquire skills which will be useful after graduation

Fig. 0-2 The Purpose-Measure Relationship DTCN/DTC Methodology



Acknowledgments (1984, 1997, 2001)

Owing to the above process, I'd like to make two acknowledgments corresponding to "A New Way of Thinking and Procedure for Design To Cost," and "Advanced Project Management Methodology (Thinking and Procedures for DTCN/DTC)"

Acknowledgment No.1 (1984)

On the occasion of the publication of "A New Thinking and Procedure for Design To Cost" from the Sanno-Daigaku Publishing Co.

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November 6, 1984

Gifu

Michihiko Esaki

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At Gifu
Michihiko Esaki

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Jan 10. 2002

At Gifu
Michihiko Esaki