

7.5 Setting up the Organization and Management for DTC Works

7.5.1 Input

7.5.2 DTC Work Activities (Assurance Activity Prior to the Output)

7.5.3 Output

7.5.4 Adjustment and Confirmation of DTC Results (Post-Assurance Activity)

The work procedures of DTC processes have been explained up until Chapter 7.4. To make the most of these procedures, proper organization and management for DTC works is indispensable. Figure 7.5-1 shows a comparison of a conventional system and the DTC work structure. Figure 7.5-2 illustrates the relationship between input and output in the overall work structure.

7.5.1 Input

(1) The order to proceed with DTC by top management

The order by top management is the essential to starting up the DTC works.

DTC will not begin systematically without this order, the approval of the DTC implementation plan document, or the appointment of a person in charge of the follow-up.

(2) Securing the Implementation Budget for DTC Activities

Securing an implementation budget for DTC activities becomes an essential starting point to create a structure that can force the DTC activities and examinations report to fit into the budget. If you ignore this, DTC activities will be perfunctory, bringing no outcome.

(3) Setting Conditions for Estimates

As mentioned earlier, the basic principle of DTC requires information of differences through cost comparisons. In order to secure the simultaneity of the comparisons used for cost comparison, each estimate cost must be converted to a fixed base year and adjusted for the foreign exchange rate. In other words, allow designers to easily compare the design plans by excluding the effect of cost fluctuations, such

as price increases unrelated to the comparison of design plans.

What is important is which cost items are included in estimate costs (either estimated in a macro sense or cumulative.) Hence, a WBS should be used to clarify the setting of estimate conditions and the range of estimates as illustrated in Figure 7.5-3. To rationalize and expedite the estimate request, estimates, and DTC examinations using estimates, prepare an in-house estimate request and cost price breakdown table, shown in Figure 7.5-4 and Table 7.5-1. With these lists, find the key to the DTC examinations.

(4) Difference between Target Cost and Present Cost for each WBS

The driving force of the DTC works is the difference between the target cost and the present cost. Target costs allocated to the WBS and the estimate costs drawn from each case of the present design plans must be indicated in a way that will allow you to easily visualize the difference in costs. Think of some ways of utilizing the difference as a driving factor. The DTC cost status report in Figure 7.5-5 is an example. Each WBS comes with 2 or 3 comparative plans at the beginning of the design. Draw graphs reflecting the Baseline plan, Cost maximization plan, and Cost minimization plan. Take out the driving factor from these graphs to control the DTC.

(5) Data

Summarized past data

Past data on both prices are highly reliable and efficient when starting a new assignment. However, these data will not be useful if they are not integrated. There is also a tendency that even if the data are organized into a cost table for a certain period of time, they may quickly become outdated due to changes in price and sale situation. To prevent this from happening, using the K-Card System will allow you to accumulate the data.

(The letter K in K-Card System stands for the initials of its designer, Mr. Katsuyoshi Kawai from Kawasaki Heavy Industries Ltd.) (Recently, the letter K has also come to stand for Know-how. With this interpretation, K-Card contains points explaining Know-how, as well as Points 1 and 2 of the following:

Main Points and Rules of the K-Card

Point 1: The name of an object indicates its function and shape at the same time.

Point 2: The name, for instance, will be expressed, "table, round top, with one leg." (A standard name followed by adjectives that explain its features. Place a comma between each description point.)

Point 3: The price of an object is roughly decided in the manufacturing process. Symbolize the prices and classify them. At a later stage, use these classifications to study what changes cost-driving factors bring about.

Point 4: Consider Points 2 and 3 to be Keys. Prepare a card, make a sketch, and write down the cost, function, and performance for each name.

How to use them: Prepare the cards in the above manner. Every time there is a need, divide the cards into groups according to the purpose. Read from each card group the tendency of relationships of performance and cost, and of size and cost. Cost-driving factors will be revealed as you divide the cards into different combinations of groups and analyze them.

Characteristics: Do not bring the accumulated data right into the cost table as you did before. Instead, accumulate the original information in card form so that it may be re-grouped and utilized in various ways. Try to group the cards according to the purposes.

Prepare many K-Cards from large assemblies to small parts. Using these cards, you may be able to uncover unexpected tendencies for every design purpose and in any design phase just by analyzing them with a pocket calculator. Figure 7.5-6 is an application of these ideas in the K-Cards for purchase goods. The price of purchase goods tends to be affected by the lot size effect and economic indices at the time of purchase. Therefore, remember to perform a correlation analysis. Figure 7.5-7 indicates the procedure for carrying out such a price analysis.

Epitomized, additional new data from around the world

To work with DTC, do not depend only on the data at hand. Use all the data existing in the world. The collection of world-wide information should be carried on in the way you deal with the selection of purchase goods.

Data according to the table of themes/ideas.

and are data from the outside. Yet, remember that all the participants in the DTC system are also full of information. Extract their information by theme/idea form for the WBS theme phasing technique for the DTCN methodology. Place the information in the order of the themes or ideas, and make use of it.

(6) Organization

Organize the structure as illustrated in Figure 7.5-1 to bring creative activities into the teams. Draw a DTC implementation plan document including this, and obtain approval within the organization. In order to concretely apply this structure, bring together members of each section in a room where the whole design section can be observed. You must do so, without exception, to bring success to DTC.

If you omit this all-in-one-room setup in the stage where you create and compare A-approach plans, the crucial comparison plans will be created in small ranges, resulting in very few numbers. At the same time, positive cooperation during later implementation phases will be ineffective, and the company will not be able to work on DTC activities to the best of its ability.

The structure of this mechanism allows people in the same room to randomly communicate with each other without asking why. If the staff are placed in different rooms, they have to come up with questions or reasons for going into another room. Moreover, the staff will not have the opportunity to speak with others unless they have something to ask.

When you develop a completely new product, there may be no explanations to the question "Why?" because there is no precedent. Therefore, a separation of workplace will cut off communication among the staff. The creation of an indispensable, all-in-one open-room system should be made for these reasons. It is important for the CEO of a factory or a company to request that work to begin DTC be done in an all-in-one-room system.

(7) Rules of Work Flow

Within the above organizational structure, set the rules for the workflow as shown in clause 7 of Figure 7.5-2. Have the participants agree. The secretary for DTC should make and publish a detailed guide containing DTC instructions in addition to the DTC implementation plan document.

7.5.2 DTC Work Activities (Assurance Activity Prior to the Output)

The basic work pattern using the DTC worksheet in the DTC phase and detailed works must repeatedly go through from the higher to lower levels of the WBS for design work. Use a DTC cost status report and management graphs as given in Figures 7.2-15 or 7.5-5. Control the summarized output.

7.5.3 Output

DTC's output points to the technological information and purchase conditions which indicate how to produce that product. Cost fluctuates depending on the combinations of drawings, the facilities, the process, and the purchase method. In other words, in order to change the buying method (purchase conditions), you will have to adjust the representations in the drawings. Therefore, they all exist as a set. The following are possible elements to be included in the set. All the sections should act in concert. You should compare, select, and decide on the best possible combinations.

Manufacturing drawings and engineering specifications

Assembly sequence and shop operation sheet

Feasible and verifiable estimates and conditions

Jig drawings

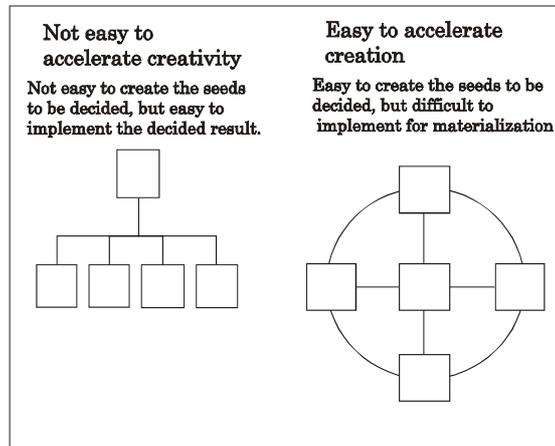
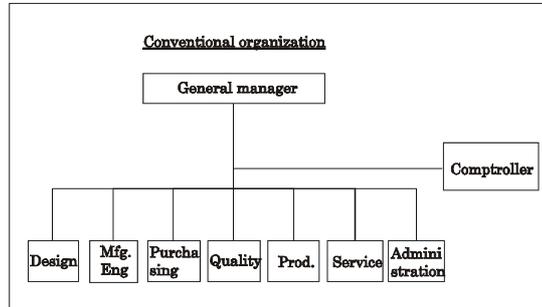
Facility plan

7.5.4 Adjustment and Confirmation of DTC Results (Post-Assurance Activity)

The post-assurance activity of DTC signifies the plan for the work of the coming phase through the production of the prototype, and its confirmation. This assurance activity also includes the creation of a draft implementation plan document of operation and logistic support, which helps to manufacture the products following the ideas of DTC effectively and efficiently in terms of cost, throughout the product's lifecycle. The above are the frameworks of input and output to make the best of DTC procedures.

Fig. 7.5-1 Comparison of conventional organization and DTC organization

Conventional organization



DTC organization

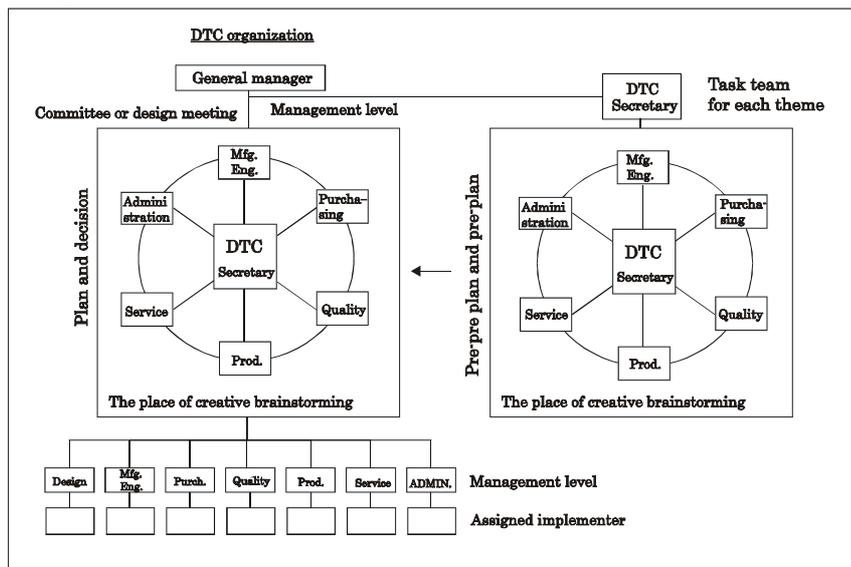


Fig. 7.5-2 The framework of DTC work activity and organization

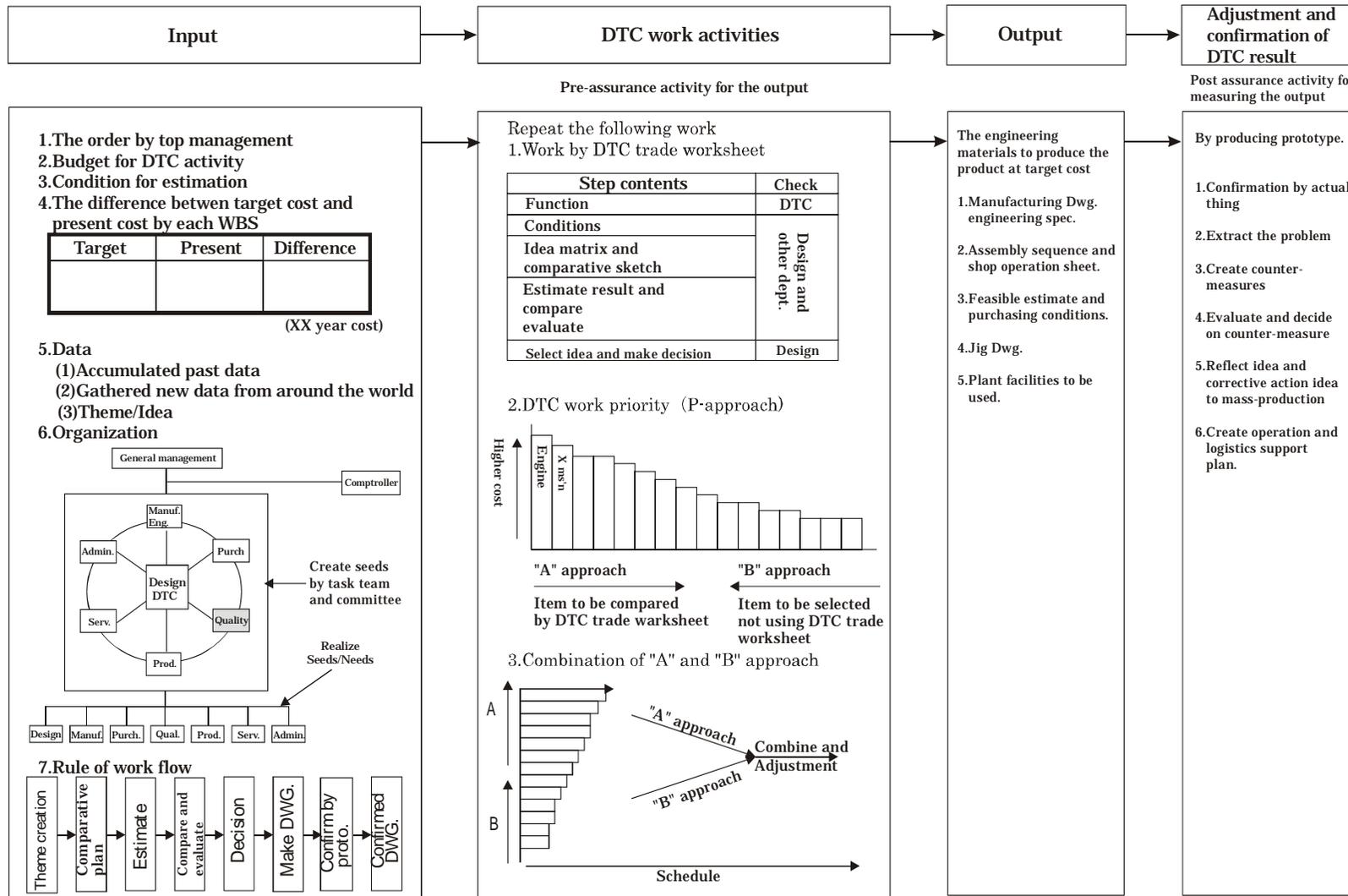


Fig. 7.5-3 Example of DTC estimating conditions

DTC estimating conditions

1 . General

- (1) Object : Unit production cost
- (2) Point of time : xx year's cost
- (3) Materials to be used for estimation shown in grade of estimate according to design phases
- (4) Production quantity : xx unit, total in xx years period
- (5) Lot size : Production plan shown
- (6) Learning curve : a. Inside fabrication LC ()%
: b. Assembly inside LC ()%
: c. Purchasing part LC ()%
- (7) Exchange rate : \$ = xx Yen
DM = xx Yen
- (8)

Estimate item	Content	Assigned	Baseline of estimation
Direct material cost	1.Raw material (R/M,C/F) 2 .Part (L/V, H/V) 3 .NET and related rate calculation 4 .Purchasing rout(Especially import rout) 5 .Forging/casting pattern cost 6 .Equipment development cost 6 .Engineering and its document cost 7 .Manual cost		Price at warehouse
PROD.M/H	1 .Part fab. M/H 2 .Assembly M/H 3 .Sub con M/H(Fab. and Assy) 4 .Fab.part inspection M/H 5 .Assembly inspection M/H 6 .Functional test, adjustment and inspection M/H (Insp. Prod.)		
FAB. cost out side	1 .Sub-con(Fab. assy.) 2 .Sub-con source book production 3 .Procurement document sheet production		
Quality cost	1 . Direct materials 2 . Inspection M/H 3 . Travel cost		
Jig cost	1 .FAB. part JIG. 2 .Assembly JIG. 3 .TEST JIG. 4 .JIG maintenance cost 5 .JIG repair cost. 6 .JIG inspection cost 7 .JIG design cost(In the case of sub-contract)		Estimate independent to unit production cost

Fig. 7.5-4 Form of In-house Estimate Request

() Group Ser. No. _____

Request to estimate by sketch drawing to be examined

To Mfg. planning/material planning group

Required date of estimation / /

From _____ Group/DTC office

Date / /

Purpose of estimate	Mark " " on number : 1.Estimation before comparison 2.Estimation to compare. 3.Estimation just before making plan drawing 4.()					
Object to estimate	W B S (Level) No.	Nomenclature				
Rough idea and attached materials name						
Category	Material name or similar part No.	Wealth of part	Number of item	Part quantity	Estimate cost	Note
Purchase part	Material name or similar part No.					
	MAT. CAT. (Except. EC64)					
Fabrication part						
Write similar part No. in past production when it is forging or casting						

↑ Write category(casting, forging, sheet, pipe, bar, extrusion)

Fig. 7.5-5 DTC cost status report style to show the possible width of selection

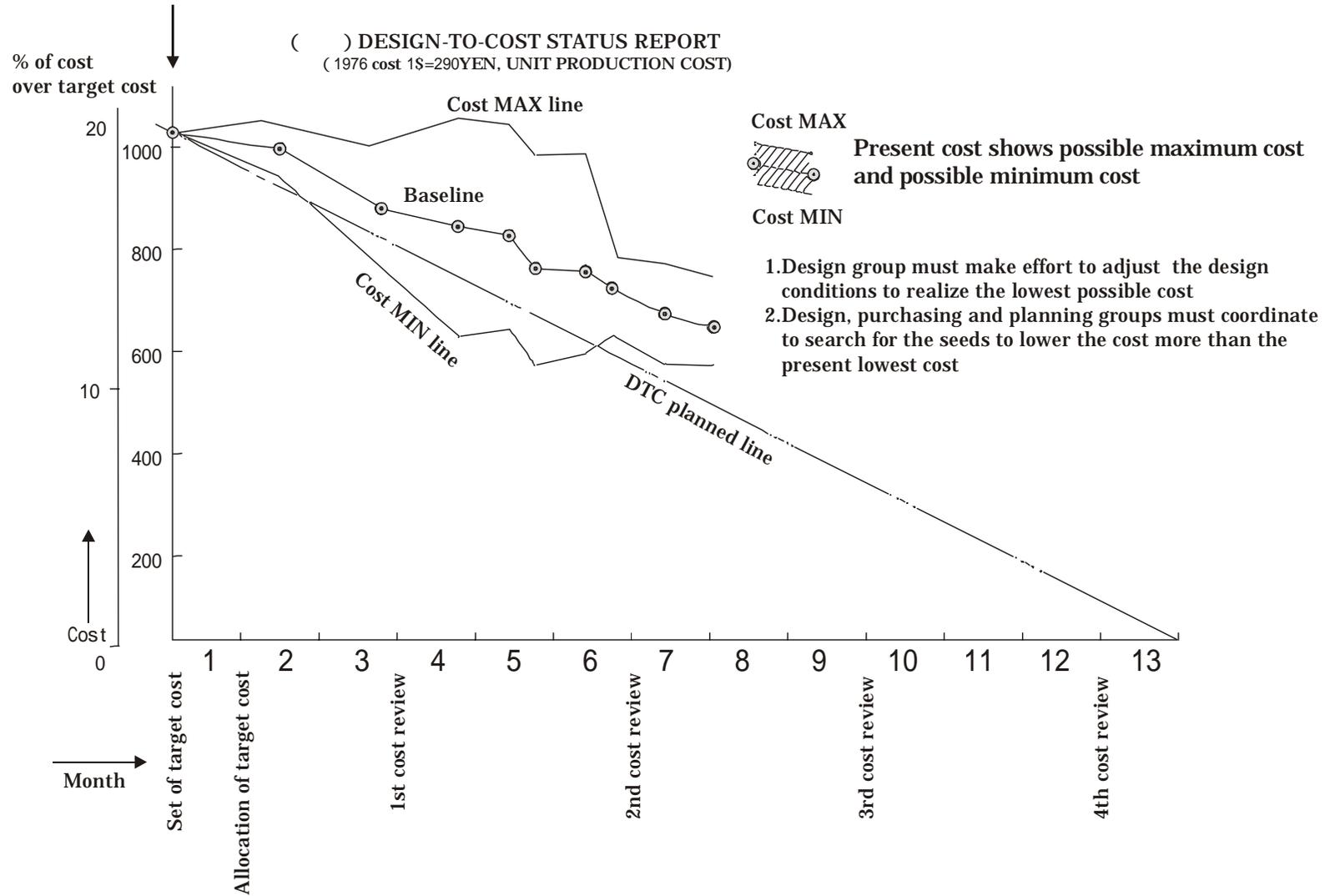


Fig. 7.5-6 K-card system

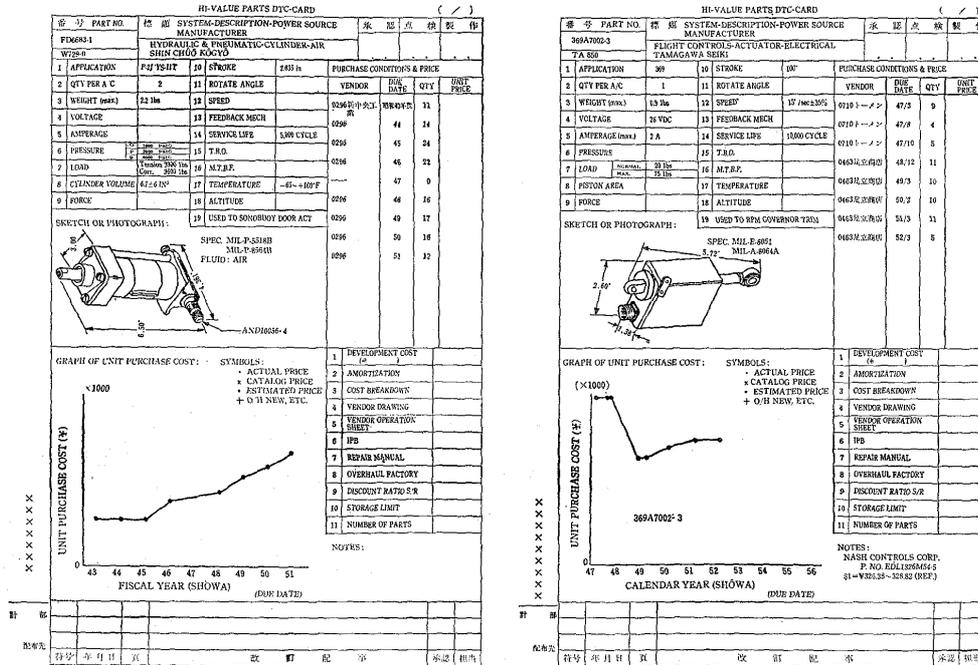
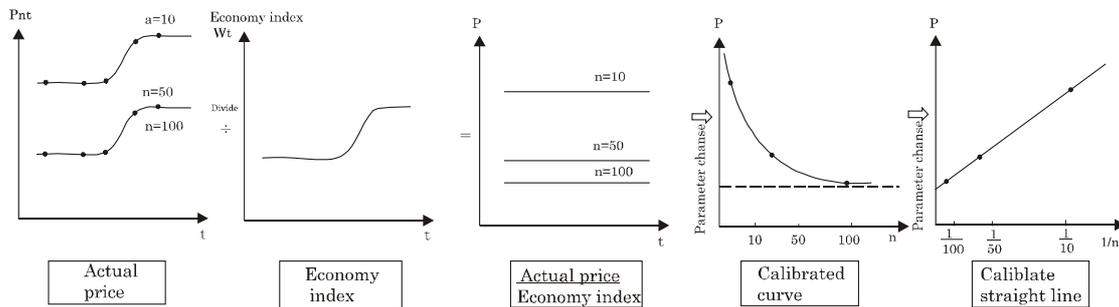


Fig. 7.5-7 The procedural concept for analyzing price

Model formula

$$P_{nt} = (R + \frac{S}{n}) W_t \cdot a$$
 Pnt : Unit price:Quantity n, at time t
 Wt·a : Correspond index at time t, time slip month a
 R,S : Recurring cost, Set up cost
 Economy index: Indices of



The calibration procedure to find the correlation of part or material price to the economy index and quantity or time