Appendix B-3

Creating Customer Needs by Information Node and Concurrent Engineering Flow Chart

1. How can the Information Node for concurrent engineering be created by means of the DTCN/DTC method?
2. How can customers' needs be created using this key?
3. How can concurrent engineering be carried out?

Creating Customers' Needs and Flow Chart of Concurrent Engineering

By rearranging the DTCN/DTC method,
"Creating Customers' Needs and Concurrent Engineering Flow" by "Information Node"
becomes:

1. Way of thinking

In the process of doing work using information, it becomes important that all the parties concerned share information, make a decision, and make the results visible to any person at a certain stage of the process (Information Node). The success or failure of these actions depends on the time and pattern by which information is shared (e.g. format and method for preparing/using information).

2. In this paragraph, a concrete method of carrying out concurrent engineering based on this consideration is described.

Namely,

(1) P-Drawing Meeting is employed for the above-mentioned "stage."
Also the following items are considered as the format and documents for information sharing:
(2) Trade Worksheet of DTCN/DTC;
(3) PMP (Pre-Manufacturing Plan);
(4) Drawing Release Request Schedule; and
(5) Drawing before release of formal manufacturing drawing (sometimes called a white drawing).

These stages and format/documents together are called "information sharing point (Information Node)," which is handled as a trigger (an opportunity or a handhold) for advancing concurrent engineering. Here we take up an example in which the opportunity for concurrent engineering is built up in the flow starting with the creation of customer needs and ending at customer satisfaction.

3. What is the real nature of Concurrent Engineering?

There has been only one figure, shown in Fig. 1, in conventional books which illustrates concurrent engineering in an information-oriented system. Namely, the contents of concurrent engineering and how it works have not been clarified so far in any books. The only explanation of concurrent engineering is realized by the fact that information is shared in the box shown at the bottom of Fig. 1 (CALS-type of concurrent engineering).

The way of thinking shown here is one concrete method for realizing concurrent engineering. That is, when manufacturing drawings are complete, everything for manufacturing is already prepared so that production can be started.

4. **Making Triggers for Sharing Information for The Sake of Concurrent Engineering by DTCN/DTC Method and a Concrete Example** (See Table 1.)

Table 1 is a stepwise description of the trigger for sharing information. Figs. 2 to 4 can also be referred to. Specifically, making a DTCN/DTC Worksheet as shown in Fig. 2 enables us to make transverse consideration steps, as shown in Fig. 4, through the flow of work, as shown in Fig. 3.

As a result, all of the following items obtain triggers to simultaneously start the work of examining:

A. Plan to Cost (Division in charge of production engineering),

B. Plan to Operation Cost (Division in charge of operation),

C. Logistic Support to Cost (Division in charge of logistic support), and

D. Sales to Cost (Division in charge of sales)

To make an information sharing point for concurrent engineering, it is most important that first a steplist is produced using the DTCN/DTC method. Then the cause and effect relationships are carefully investigated. Next, the Node at which the personnel concerned argue is identified. And finally, the important matters required for rapidly making good cheap products are decided. These Nodes are put together and called the Information Node.

Fig. 1 Comparison of Conventional and CALS/Concurrent Engineering

(From: Successful CALS by Kazuo Nezu)

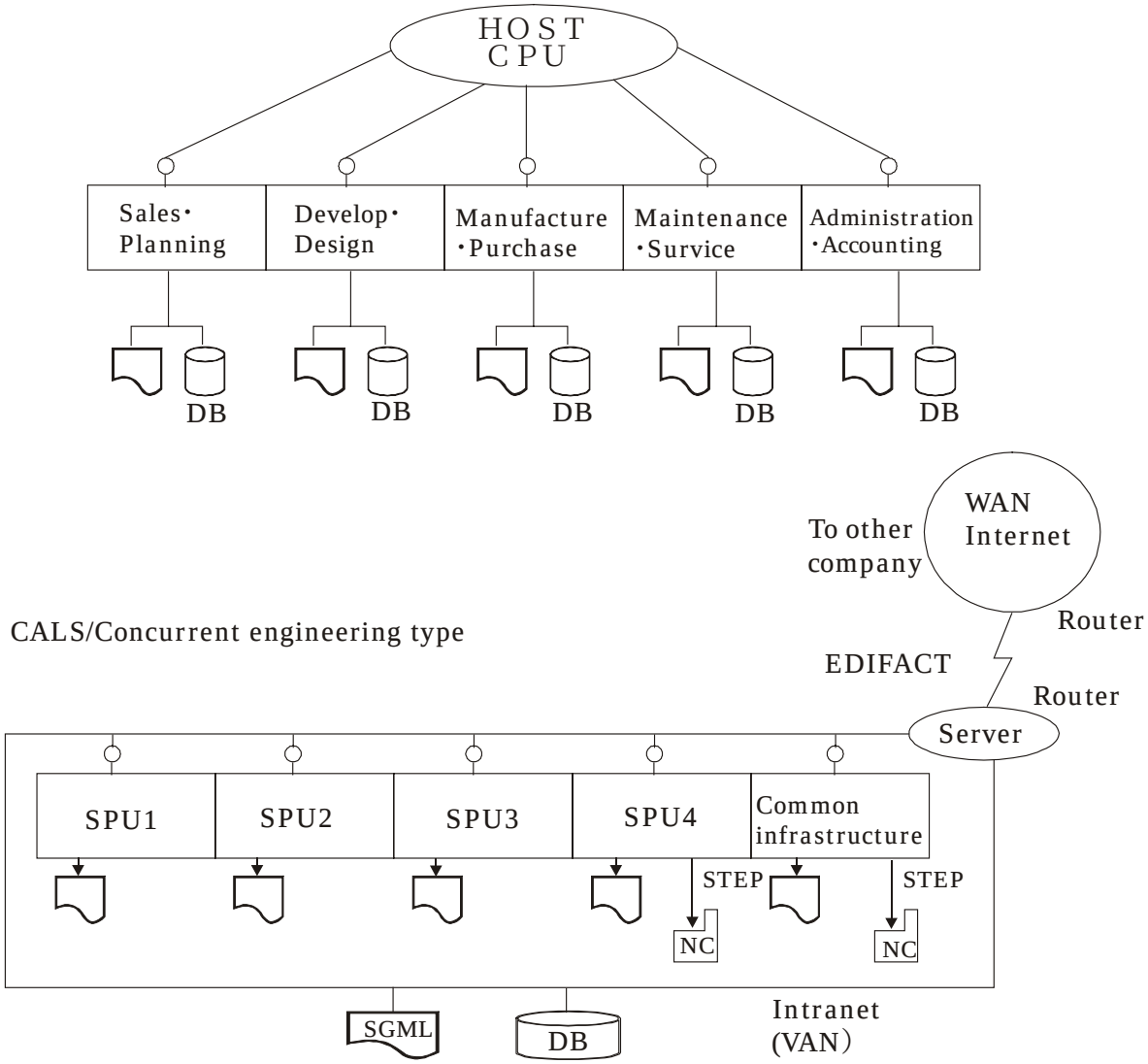

Table 1 Trigger for Sharing Information

	Step of trigger	Trigger tool	How to create the trigger
1.	Before to draw the Conceptual drawing	DTCN/DTC trade work sheet (see Fig.2)	Create DTCN/DTC trade theme from reviewing the base line idea
2.	Before to draw the basic plan drawing	DTCN/DTC trade work sheet	Create DTCN/DTC trade theme from viewing the conceptual drawing and its WBS
3.	Before to draw the detail plan drawing (e.g. Final selection of basic material)	DTCN/DTC trade work sheet	Create DTCN/DTC trade theme from viewing basic plan drawing and WBS
4A.	Before to draw the manufacturing drawing(Draft)	P-DWG, Meeting (Plan drawing examination meeting before making each manufacturing drawing)	Draw out the ideas to be waved into manufacturing DWG with production department people
4B.	Before to finish the manufacturing drawing	DCCB(Design Change Control Committee) examination by re-planning work sheet	Get agree between the manufacturing plan group and design group people on manufacturing drawing draft
5A.	Before to draw the manufacturing drawing	P-DWG, meeting	Same as step.4A
5B.	Before to finish the sub-assembly drawing	DCCB(Design Change Control Committee) examination	Same as step 4B
6A.	Before to draw the assembly drawing draft	P-DWG. Meeting	Same as step 4A
6B.	Before to finish the assembly drawing	DCCB(Design Change Control Committee) examination	Same as step 4B

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Fig. 2 (Appendix B-3) Example of Filed DTCN/DTC Trade Worksheet

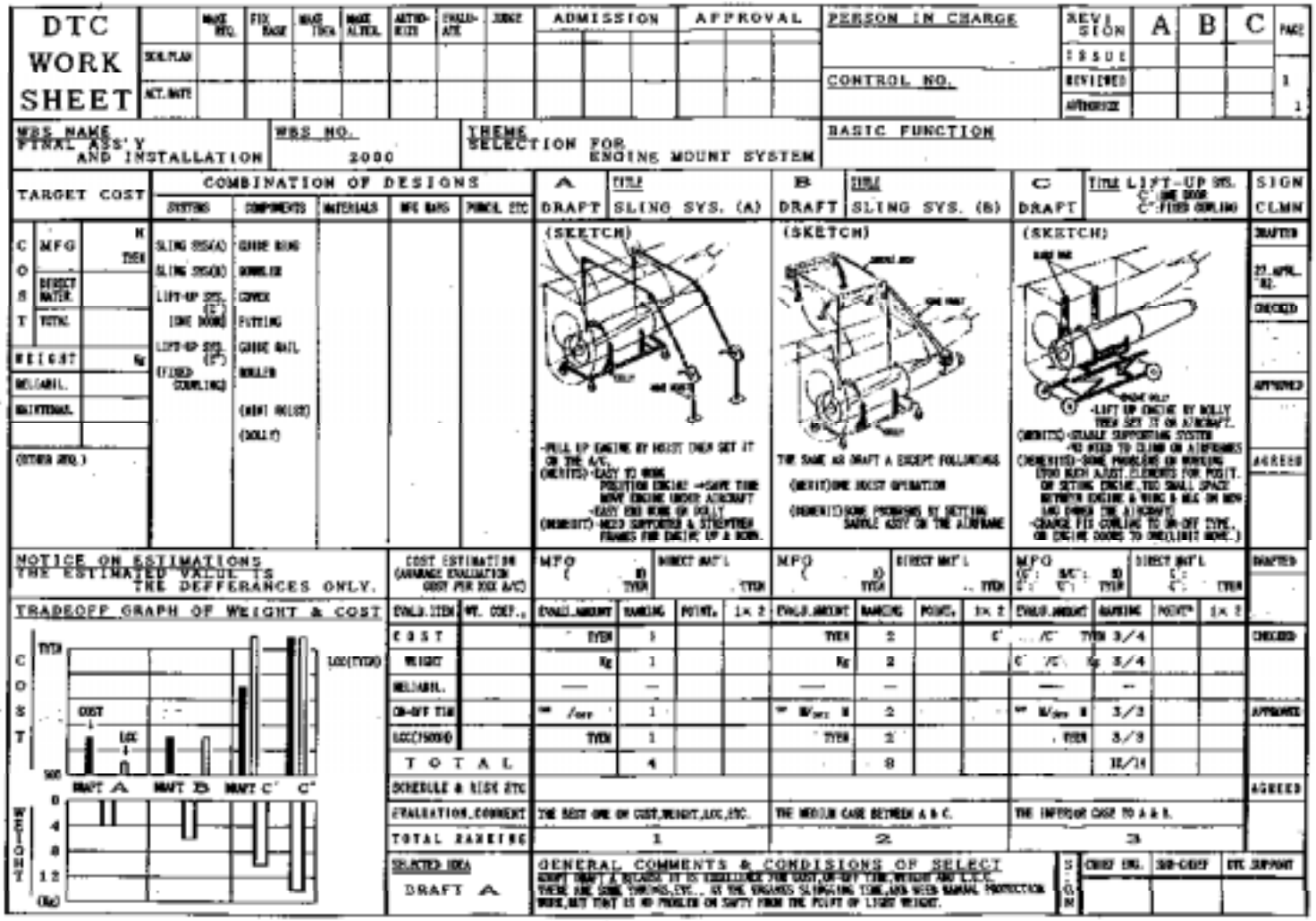

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Fig. 3 Flow diagram to create information node of CALS/BPR/Concurrent Engineering by DTCN/DTC methodology

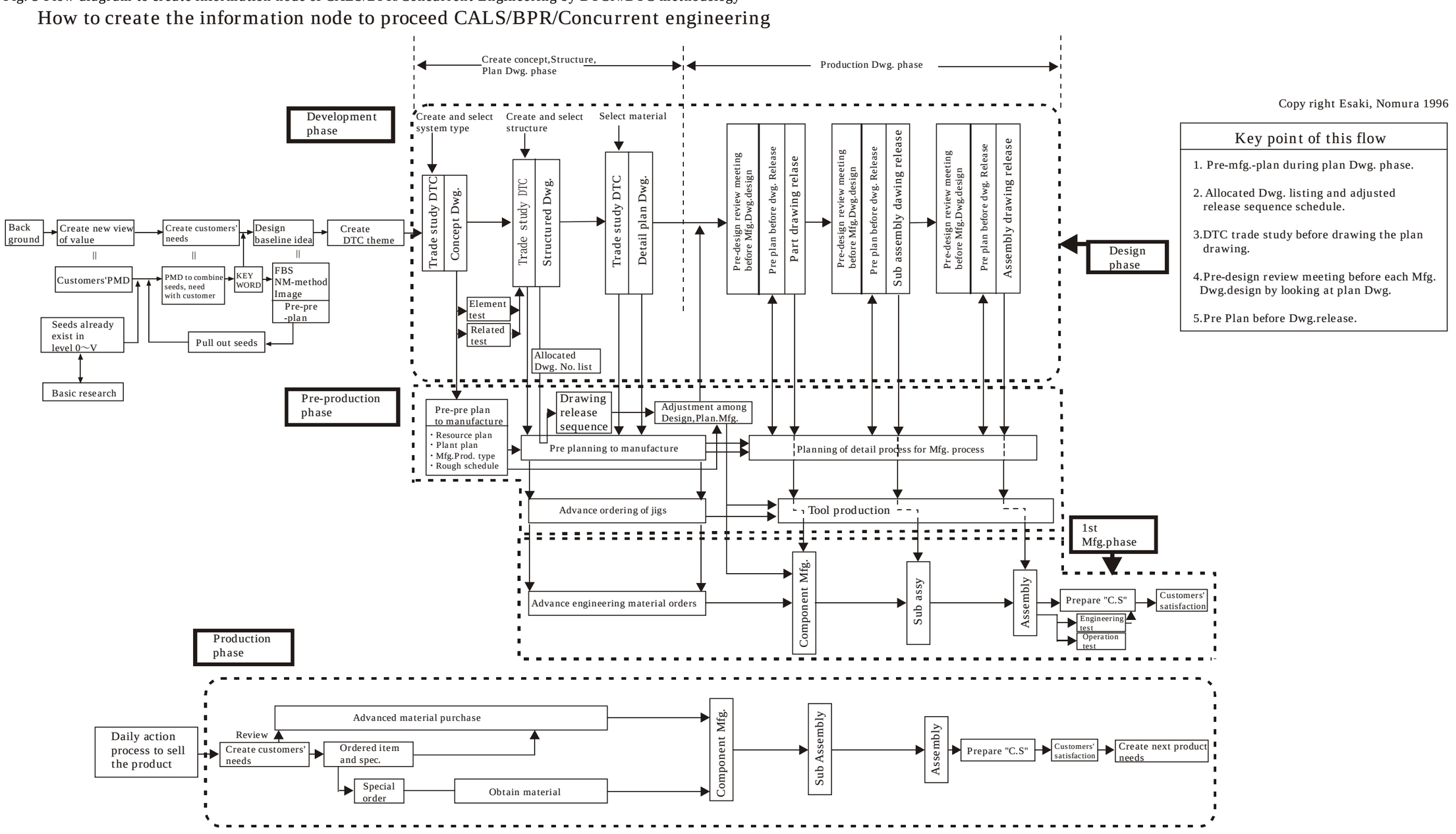

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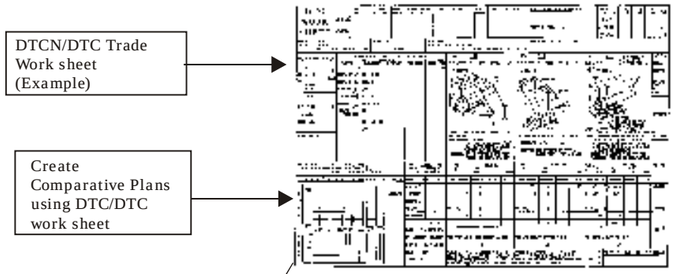
Fig. 4 Trigger Mechanism of Information Node for CALS/BPR/CE Mechanism by DTCN/DTC Methodology



DTCN/DTC Trade Work sheet (Example)

Create Comparative Plans using DTC/DTC work sheet

CREATE THE THEMES, THEN CREATE THE DTC WORKSHEET, CREATE THE STARTING POINT OF CONCURRENCY AMONG CONCERNED GROUP

DESIGN GROUP | MFG. PLAN GROUP | MANUFACTURING GROUP | OPERATION GROUP | LOGISTIC GROUP | SALES GROUP

DTC TRADE STUDY TRIGGERS THE COMMON INFORMATION NODE AMONG THE CONCERNED PEOPLE AND CONCURRENT ENGINEERING AND PRODUCTION

PHASE	DESIGN TO COST
I REQUIREMENT	MAKE CONCEPT DRAWING AND WBS
II CONCEPT DRAWING	TRADE STUDY OF SYSTEM AND WBS
III BASIC DRAWING	TRADE STUDY OF COMPONENT AND EQUIPMENT
IV PLAN DRAWING	TRADE STUDY OF MFG. PROCESS AND DETAIL IDEA
V MANUFACTURING DRAWING	
VI MANUFACTURING	TEST AND EVALUATE THE PRODUCT
VII REVIEW	REVIEW AND CORRECTIVE ACTION

PHASE	PLAN TO COST
I	・TRADE STUDY SUPPORT BY ESTIMATION ・ESTIMATION OF PRESENT COST AND SET THE TARGET COST
II	
III	ESTIMATE THE IDEAS AND SET THE PART ITENS NUMBER
IV	PLAN THE PRE-PLAN
V	PLAN THE MANUFACTURING PROCEDURE. DESIGN THE TOOLS
VI	FIND THE PROBLEMS AND THE PLAN THE SOLUTION BY MAKING PRODUCT
VII	NORMALIZE THE SHOP LOAD AND SHORTEN THE MAKING SPAN

PHASE	MANUFACTURING TO COST
I	ALLOCATE MANUFACTURING COST
II	MAKING JIGS
III	MANUFACTURE THE FIRST PRODUCT
IV	REVIEW THE GENBA BEFORE ALL OVER THE PRODUCTION
V	CONTINUE COST DOWN EFFORT ALL OVER THE PRODUCTION

PHASE	MISSION OP. TO COST
I	STUDY AND TRADE TWO OR MORE PLANS BY STAND POINT OF MISSION SUCCESS AND COST EFFECTIVENESS
II	
III	
IV	
V	
VI	
VII	
VIII	

PHASE	LOGISTIC SUPT TO COST
I	STUDY AND TRADE TWO OR MORE PLANS BY STAND POINT OF READINESS AND COST EFFECTIVENESS
II	
III	
IV	
V	
VI	
VII	
VIII	

PHASE	SALES TO COST
I	STUDY AND TRADE TWO OR MORE PLANS BY STAND POINT OF SALES PROMOTION
II	
III	
IV	
V	
VI	
VII	
VIII	

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