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2.2 Steplist Management Method to Create a Faultless Phased Procedure

2.2.1 Introduction

In this section, we explain how to create faultless phased plans with the Steplist Management method.

Based on a knowledge of input-output relationships, as in Fig. 2.2-1, and the procedure creation format in Fig. 2.2-2, the Steplist method can accomplish the following:

(1) Transform the framework of rough procedures obtained by PMD into a detailed procedure of thought and action.

(2) By using mechanism (1) above, concepts can be realized as procedures.

(3) One may allocate the various conventional management and development methodologies into an input-output (causal) relationship to be used most appropriately.

2.2.2 Explanation of the Steplist format

(1) Thinking and procedures may always be considered repetitions of input-output (causal) relations.

To take a simple example, consider "How to cook rice well" in Fig. 2.2-1. We can understand it as "input item (rice, water, heat), pre-assurance activity (cooking = how to create output from input)+ {assurance conditions (strength and duration of heat), output item (cooked rice)}, post- assurance activity (taste the rice) + {assurance conditions (the taster must know the tastes of the customer)}." By filling in the 4 frames in the lower half of the figure, elements of thinking or operation can be faultlessly picked up.

(2) The framework in Fig. 2.2-2, read in the vertical direction, has eight steps, comprising four steps of an inductive approach and four steps of a deductive approach for phased and faultless operations. Read in the

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horizontal direction, it assigns faultless items to the input-output (causal) relations stated above.

Fig. 2.2-3 is a restatement of the framework of Fig. 2.2-2 for better understanding. Fig. 2.2-4 explains the eight steps of deduction and induction in an easy manner by means of a casual example.

2.2.3 The procedure to make a Steplist, and how to use it

(Explanation by means of the formats in Figs. 2.2-2 and 2.2-5)

(1) Confirm the subject name and enter it into the subject column. (Use the theme expression of PMD, or revise it as necessary.) Fill in the Main Key Word of the PMD in the subtitle column. (Revise as necessary.)
(2) Guided by the subtitle (Key Word), fill in the step elements necessary to achieve the objective following the arrows in Fig. 2.2-2 (B, C, D, and E columns). If necessary, use a large sheet of paper for the Steplist frame, attach the cards describing each element, and examine their arrangement.

Make sure to tag the element name so that the output of the former phase comprises the input of the next phase (cf. Fig. 2.2-3).
(3) Review the whole, and if there are processes, elements, conditions or other things missing which are necessary to achieve the objective, add them. In column F (other conditions), fill in the note and advice items which are common to the phase. In column G, fill in the name of the output decision-maker to move to the next phase and the expected approval date. In column A (step content) give and fill in a suitable name for each step content.
(4) In the upper right hand corner of the form, the highest authority gives his/her approval by signing, and designates the promotion officer so that the operation proceeds along the Steplist. In column G, specify which phase of decision-making the authority participated in.
(5) The promotion officer follows up on the directions. The parties concerned repeat thinking and action, and make decisions for the next step to realize the objective result shown in column 7D.

2.2.4 Supplementary notes

(1) Details of "procedure (2)"

A. First, fill in column 7D (column for output item in the execution or implementation phase) with a noun expression for the output item suggested by the Key Word. (An expression embodying the content is desirable).

B. Fill in column 1B with the material and resources required first as the input to realize the output

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items in column 7D. Create the objects for 7D step by step by the following procedure:

C. Fill in column 2D (output item column for the basic idea) with item names appropriate as output.

D. Fill in columns 3-7D (output item columns) with the item names appropriate as output.

For the output items in each phase, fill in the pre-assurance activity, post-assurance activity, and input item, so that there is the sequence "input item," "pre-assurance activity," "output item," and "post-assurance for the activity input item of the next phase."

E. The expressions in the input or output item columns, such as PMD, directions, reports, or diagrams, must be names of things. On the other hand, the expressions in the pre- or post-assurance activity columns must be nouns expressing actions, such as making the directions document, information collection, or approval.

F. The standard division is eight steps as in Fig. 2.2-6, but one may integrate or subdivide as necessary. Even then, it is important to keep in mind the basic way of thinking for the 8 steps. (It is particularly easy to forget the fourth phase, that is, 2nd information collection.)

In the following cases, additional steps are necessary.

a. Parallel operations are present in one step.

b. When decision-making may include "an offer and acceptance relationship"; for example, the price of land. To make an appropriate offer and acceptance, one may request a report by a third party, which leads to further steps. The number of steps necessary, for example, 10 or 12, will become apparent as elements are filled in in the standard Steplist columns.

G. The above procedure for various elements and activities is followed to achieve the objective in 7D, but there are cases when the steps do not form a logical sequence. In such cases, one tries to complete the sequence in the following manner: "There should be something" - "Is a new way of thinking necessary?" - “Put something in to connect the sequence" - "What should we put in?" - "What should we do here?" - "What do we need here?" - "Is a new step necessary?" and add new steps if necessary. With the above effort, what was invisible becomes manifest. This is the "procedurization of concepts," the creative result of the SteplistSteplist.

H. The so-called evaluation standards for output correspond here to assurance conditions for pre- and post-assurance activities, but if the conditions are tacitly understood, they can be omitted in the Steplist.

I. Not all the expressions extracted in PMD have to go into the Steplist. The Steplist is a place where the causal relations and their assurance conditions have to be filled in. It is only necessary that the expressions of PMD be embodied in the result.

J. The difference between the rough procedure, given by the PMD read from the bottom upwards, and the detailed procedure, given by the Steplist, is that the PMD is a hypothetical (abductional) procedure which is roughly created by communication between the forebrain and hindbrain. On the

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other hand, the Steplist is a procedure which adds a check by the communication between the left and right brains to eliminate faults. Hence, it may be said the relation between the Steplist and PMD is that first the framework is understood using PMD, and then a concrete faultless operational procedure is created with the Steplist. (More hypothetical and detailed explanations are given in Episodes 1, 2, 3, 5 and 7.) The above constitutes the mechanism of step creation in order to realize an objective.

2.2.5 Examples

Fig. 2.2-7 is a Steplist made by an office worker to materialize the PMD of Fig. 2.1-1 in subsection 2.2.1 on the construction and management of an apartment house.

Some important lessons learned while making the Steplist were:

(1) By solidly arranging for the estimate in the breakdown structure phase prior to the actual estimate, subsequent views hardly diverged between the owner and the contractor. Thus, smooth coordination was secured up to the completion of the apartment.

(2) The owner realized the need for an instruction booklet for the tenants and a checklist for damages with the cooperation of the tenants and the real estate agency, and made them. With the checklist for damages an inspection list for repairs, and a procedure to check damages generated by the next tenant became possible. This format utilizes the information of difference when tenants move in and out of the apartment.

(3) With the instruction booklet, inspection checklist, and lease, satisfactory management between the owner, the real estate agency, the contractor, and the tenants became possible. Owing to the contract and format, each party could freely express their opinions and desires, leading to a satisfactory lease system and operation of the apartment.

These ideas from 20 years ago have been adopted in modified form by apartment constructors and mediators today.

2.2.6 Considerations

If we compare the PMD of Fig. 2.1-1 and the Steplist of Fig. 2.2-7, we realize the following:

(1) Block No. 9 of the PMD "Capitalize on the falling price of construction" corresponds in the Steplist "what phase of output must be determined by when." The expression "Capitalize on the falling price of

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construction" in the PMD does not appear in the Steplist.
(2) This is what is meant by "the PMD read upwards gives only a rough procedure," and one understands that a Steplist is necessary for creating a detailed procedure.
(3) Also, for each step of the Steplist, there is a column for filling in the conditions for pre- and post-assurance activities, so a positive evaluation standard is available for ensuring the quality and the timing of thought and action at that step.
(4) Fig 2.2-8 shows the double 4 boxes of a faultless Steplist, the PERT (Program Evaluation Review Technique), and the corresponding comparison between the abilities of the left and right brains.

- Comparing the PERT with the Steplist, a Node in PERT terminology corresponds to where the decision activities from the post-assurance activity to the input of the next step narrow into a single channel.
- Also, if the content of the Steplist is compared with word order and the abilities of the left and right brains, we can say the following (cf. Figs. 2.2-9 and 2.2-10)
- Input and output items correspond to the left (logical) brain, and work and sampling correspond to the right (sensory and image) brain.
- If we consider the difference in word order between English and Japanese, we obtain Fig. 2.2-9. "I make you happy" in English becomes "Watashi-wa (I) anata-wo (you) kofuku-ni (happy) suru (make)" in Japanese. In this case, you and I are items that belong to the left brain. On the other hand, make and happy are action and feelings, so they belong to the right brain. If we show this in Fig. 2.2-10, we see that English requires three crossings between the left and right brain, but Japanese only requires one. A phenomenon which may be evidence for this is that English-speaking people frequently shake their heads when speaking, whereas Japanese rarely do. The difference in word order may affect how people who speak different languages view things, think, and respond.
- Once the Steplist is created, the situation changes radically because thought and action can be examined (see Note) in any order. In other words, the creation of the PMD and Steplist means that purpose-measure relations, causal relations, procedures, and assurance conditions can be visualized like a map from any direction so that, at least within this range, people of different languages may combine their characteristics to create a common understanding and procedure.

Note: What does examine mean? Examine means creating two or more realistic plans or two procedures, and then comparing and selecting from them.

2.2.7 Functions of Steplist management

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If the Steplist format is used in management plans, the following management functions are fulfilled:

1. Integration of available people, materials, money, time, technology, and information.
2. Standards for management and achieving motivation
3. Phased and assured procedures to achieve the objective and its operation
4. Integrated promotion system with good control
5. Place and sequence for an appropriate Offer and Acceptance relationship
6. Prevents embarrassing the people concerned
7. Proper management hierarchy

The following two cases explain the meaning of Item5 "Place and sequence for an appropriate Offer and Acceptance relationship."

(Case 1) Buying and selling land

Let us suppose that a piece of land is being rented. If the tenant wants to buy it, the price will be that of an ordinary lot. If the landowner wants to sell it, the price will be about half of an ordinary lot. This typifies the sequence of Offer and Acceptance. It is possible that a scenario to achieve the desired result can be created through a Steplist even though it may take a long time to realize the desired result in a socially acceptable manner. However, if a scenario to achieve the desired result cannot be created through a Steplist, it means that it is impossible to realize that scenario.

(Case 2)

Consider the case of developing a new product involving a huge investment. If the design is totally new, various problems or defects may appear during its realization. This kind of trouble is usually first noted by designers below middle management who have made the detailed procedure to proceed with the development and have given explanations to their superiors and won approval. From this standpoint, the more acute a problem is, the more difficulty the designers will have in admitting the problem.

Nevertheless, the problem must be quickly solved before the product goes to the market. To prepare for this kind of situation, the instruction "If a serious problem becomes apparent, acknowledge it" may be inserted in the post-assurance or output column. This will provide a place and sequence for correction.

In other words, if this clause is inserted, it becomes an order after the Steplist is approved by the highest authority. Therefore, a system has been created in which problems can quickly be attended to.

Item 6 "Prevents embarrassing the people concerned" means the following:

When a more effective improvement plan is proposed, people may seek responsibility for why the plan was

not thought of before. A pursuit of responsibility will embarrass the person in charge and his/her superior. This is particularly true the simpler the improvement and the larger its effect.

If a Steplist is used, the message is communicated that "Things proceed by steps. If a previously unknown element becomes clear, improvement becomes possible in the next step."

Therefore the attitude is fostered that "instead of looking at the result and pursuing responsibility, one should focus positively on how to utilize the result." Thus, embarrassment is prevented.

Item 7 "Proper management hierarchy" will be explained in Chapter 3 with concrete examples of Steplist level assignment.

2.2.8 Significance of Steplist management

The above constitutes the explanation of Steplist management, but we would like to add the following remarks on its significance and utility:

1. If the problems which arise in achieving the goal are not complicated, conventional methods are adequate, and the whole Steplist need not be used. However, the principles of the 4 boxes in the Steplist and the rule of using the words "To what end?" in the beginning are the keys to correctly undertanding the input-output (causal) relation, and running something effectively.
2. The Steplist method is just a tool. If procedures are adjusted and decided on, the Steplist does not need to be made explicit at any time.
3. All conventional methodologies can be joined in purpose-measure relations and input-output (causal) relations, so KJ, NM, VE, IE, QC, QFD, TAGUCHI, TRIZ methodologies and so on can be assigned to their corresponding phases.
4. Setting the subtitle (Key Word) and stepwise target values creates motivation. Together with PMD, information of difference, and the concept of the Steplist, a united judgment for group action becomes possible. This opens the possibility of joining conventional management methodologies with the behavioral sciences.
5. We can consider this to be a new language for creating the place and sequence of an appropriate Offer and Acceptance relationship.

2.2.9 Acknowledgments

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For this section, a special acknowledgment is in order.

Twenty years ago, the author wrote a paper which became the prototype for this chapter. He would like to conclude this section by expressing gratitude to his advisor, the late Prof. Tamai of Sangyo Noritsu University, and chief examiner, Mr. Nemoto of the Development VE Research Society, for giving permission to quote and develop the paper, "System approach in new product development", of the group study by the Japan Society of value engineers.

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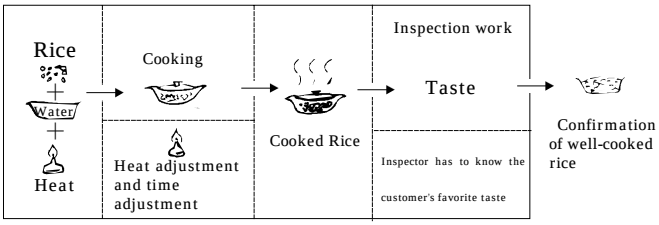
Fig.2.2-1 Faultless relationship between input and output framework using the example of well-cooked rice and its inspection work



Input		Output	
Item	Pre-assurance activity (To make output)	Item	Post assurance activity(To use output Next step)
Input Item	Work Quality Assurance Conditions	Output Item	Inspection work Quality Assurance Conditions

Fig.2.2-2 The form of steplist

(Format to draw out the faultless phased elements to reach the objective result)

Authorized by_____ Date_____

Subject_____ Phased plan_____ Promotion officer_____

Subtitle (Key word)_____

				A	B	C	D	E	F	G	H	I
Division		Basic phase step		Step Title	Input		Output		Other Condi-tions			
					Item	Pre-assurance activity	Item	Pre-assurance activity				
Phase to think about many things and decide what to do	Inductive approach	1	1st information collection									
		2	Basic idea									
		3	Breakdown structure(Structur-ing)									
		4	2nd information collection phase									
Phase to materialize the result of thinking	Deductive approach	5	Basic matter (Basic design)									
		6	Detailed matter (Detail design)									
		7	Implementation to get objective result									
		8	Review									

Fig. 2.2-3 Flow diagram of Steplist format contents

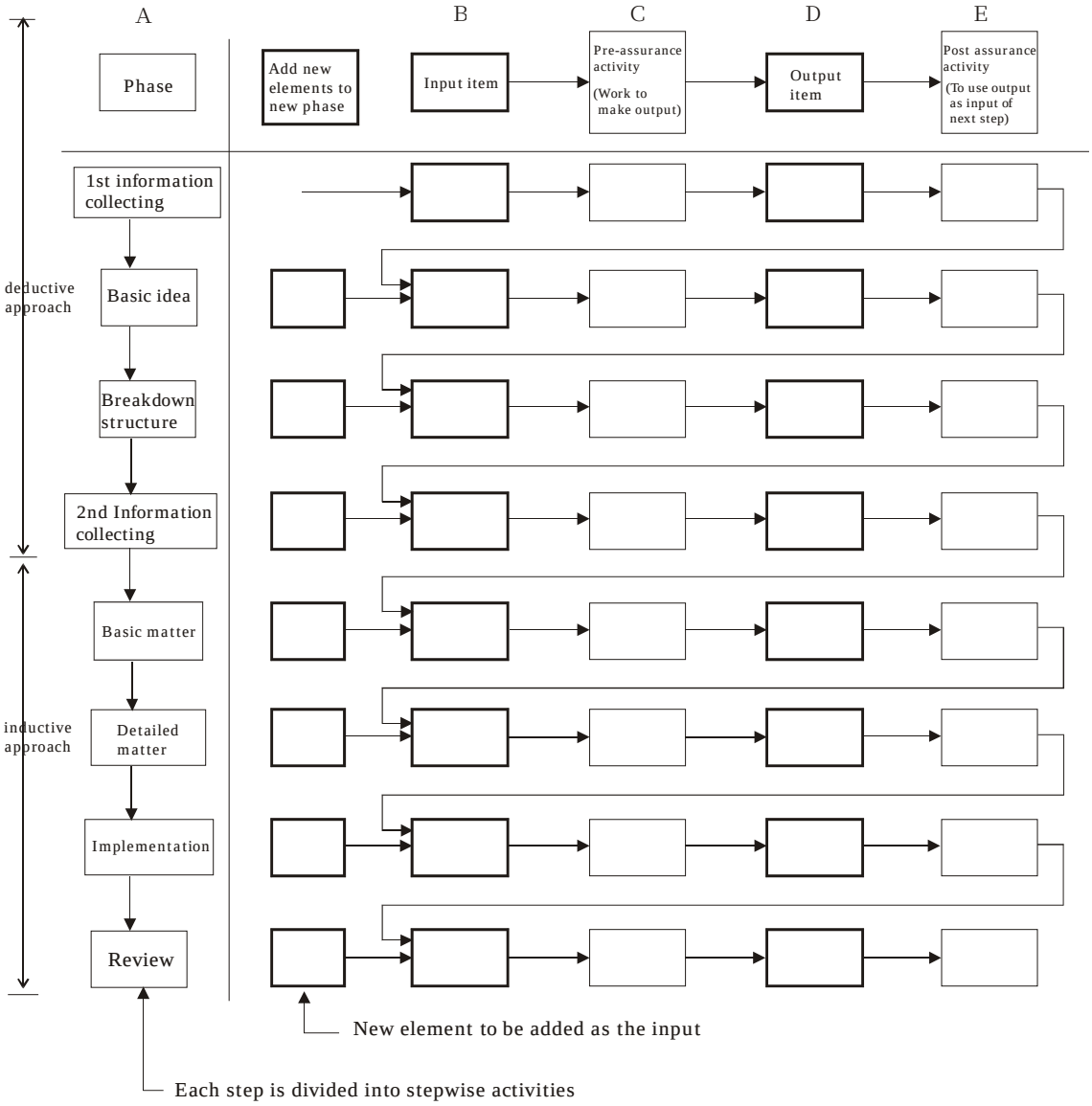


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Fig.2.2-4 Casual example of eight step

Subject : (e.g.) Business trip to OSAKA

Sub tytle (key word) : (e.g.) Go to OSAKA office from TOKYO

Phases			Activity contents	P-D-S
Phase to think about many thing and decide to do	Inductive approach	First information Collecting	To investigate the trafic means to go to OSAKA by train and airline time table	PLAN
		Basic idea	Decide to go to OSAKA by HIKARI-SHINKANSEN by comarting the information collected in former step	
		Breakdown structure (Structurization)	How to go to TOKYO station and how to reach to OSAKA office (e.g. By taxi Or subway or bus)	
		2nd information collecting	Write application format to boss and Get maney to go to OSAKA	
Phase to materialize the thought result	Deductive approach	Basic matter or Basic design	Buy ticket to go to OSAKA	
		Detail matter or Detail design	Decide suit, socks to go to OSAKA and decide where to take lunch	
		Implement	Implement	DO
		Review	Review result and decide how to do next time	SEE

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Fig. 2.2-5 Steplist Form

Subject

Subtitle (KEY WORD)

Steplist (Phased plan)

Authorized by : Date :

Promotion :

		A	B	C	D	E	F	G	H	I
		Step title	Input		Output		Other conditions	Who approves the output and schedule	Who approves the output and schedule	Actual decision datea nd notes
			Item	Pre-assurance Activity	Item	Post-assurance activity				
1	1nd collecting Information Collecting									
2	Basic Idea									
3	Breakdown Structure (Structuring)									
4	2nd information collecting phase									
5	Basic matter or basic design									
6	Detailed matter or detail design									
7	Implementation get objective result									
8	Review									

Fig.2.2-5 Steplist Form

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2.2-6 Eight steps by faultless, inductive and deductive structure

	Name of phase	Contents	
Inductive approach	1st information collecting	Collect the information for basic idea phase	Input
	Basic idea	Compare and select basic ideas	Pre-assurance Activity
	Breakdown structure (Structurizing)	Create the structure according to selected basic idea	Output
	2nd information collecting	Evaluate the structured result and decide whether to procede to next step or not	Post-assurance Activity
Deductive approach	Basic matter	Proceed the materialization of basic matter according to the matter decided in previous	Input
	Detailed matter	Proceed the detailed matter according to basic matter	Pre-assurance Activity
	Implementation	Implement and get objective result	Output
	Review	Review the result and support the objective result	Post assurance Activity

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Fig.2.2-7 Example of steplist management

Subject: Construction and management of apartment house
Sub-title: To construct and run a apartment house

Steplist (Phased plan)

(o):owner
(v):vendor
(A):real estate agent

Authorized by: Date
Promoter

		Step title	Input		Output		Other conditions	Decision level & schedule	Attendants at output briefing	Actual decision date& notes
			Items	Pre-assurance activity	Items	Post-assurance activity				
I	1st information collection	Make preparations as the owner	1.A site proposed(0) 2.Funds on hand(0)	1.Survey the land.(o) 2.Ask for the opinion of the real estate agency on the site(o) 3.Look into constraction companies (o) 4.Study by construction magazine, book etc.(o) (Unit price of construction)	1.Topographical & dimensional map 2.Demand for apartment house in the area (o) 3.Requirements and specifica -tion plan to be estimated(o) 4.Listing of possible of builders(o) 5.Rough estimate of capital required(Max & Min)	Checking of possibility of raising funds(Bank housing financing corp,etc.)		Authorized by owners on Dec.1		
II	Basic idea	Basic plan and rough estimation	1.Topographical & dimentional map 2.Demand for apartment 3.Requirements and specification to be estimated 4. Listing of builders 5. Rough estimate of capital required (Max & Min)	Outline of design (o,v)	1.Ground plan(two or three plans from each builder)(v) 2.Rough estimate(more than 2-3 plans)	Compare estimates(o)	1.In case of comparing estimates not necessary to show builder an estimate of funds required 2.As for ground plan, it is a must to have 2 or 3 plans and proceed to the next step of estimate	Jan.15		
III	Break down structure	Estimate	1.Ground plans(2-3 plans sent)(v) 2.Rough estimate(2-3 plans selected)(v)	1.Basic design work(v) 2.Previous arrangement for the terms of estimation(o,v) 3.Preparation of estimate(v)	1.Detailed plan(2-3plans)(v) 2.Finishing table schedule 3.Vertical view of section(v) 4.Estimate(v)	1.Check by management plan check list (1)Possible rent (2)Managing efficiency (3)Borrow & return plan of building funds. 2.Contractor under consideration		Feb.5	Building contractor	
IV	2nd Information collection	Contract	1.Select single detailed plan & estimate(v,o) 2.Rough estimate(2-3 plans selected)(v))	1.Negotiations(o,v) 2.Applications for construction & received of approval(v) 3.Previous arrangement for the preparation of contract(o,v) 4.Raising of funds with a loan, etc. (o)	1.Contract(draft) for awarding construction work(v,o) 2.General schedule(v,o)	Payment for starting construction work	Date expected for approval Mar. 15 is contract date with confirmation of terms for obtaining construction certification Mar.30 is the contract date to complete the above.	1.Owner 2.Building contractor responsible for the work Mar.30(Mar15)	Building contractor (1)Sales Sec.person (2) Superior for the work. (3) Sub-contractor	
V	Basic matter (Basic design)	Final approved plan	1.Contract for awarding construction work.(o,v) 2.General schedule(v) 3.Detailed requirements (v)	1.Confirmation of matters guaranteed(v,o) 2.Previous arrangement for work detail(v,o)	1.Final approved plan (Including detailed design) (v,o) 2.Detailed work schedule(v,o)	1.Approve the final plan(o,v) 2.Check day's detail work plan(o,v) 3.Confirm matters to be managed(o,v)		Mar.30	Building contractor Person in charge of design	
VI	Detailed matter (Detailed design)	Completion of apartment house	1.Final approved plan.(v) 2.Detail work plan.(v) 3.Matters to be discussed in the course of work (v,o)	1.Completion of apartment house(v)	1.General inspection before renting residents(O,A) 2.Inspection and repair of defective places(o,v)			At the end of May		Building constructor
VII	Implementation	Maintenance	1.Completed apartment house.(o) 2.Terms and conditions to the renters(o)	1. Start admission process of residents(A) 2. Instructions for residents(O,A) 3.Talk with real estate agency regarding administration(O,A) 4.Establishment of how to pay house rent(O,A) 5.Contract with residents and admission(O,A)	1.Income from house rent due to complete admission of residents 2.Result of inspection on the defective parts of the apartment house.	1.Confirmation of results of inspection on the defective areas of the apartment house 2.To the 2nd resident and repairs should be cleared (A,O)	1.Check defective areas of apartment in accordance with checklist 2.The measures to solve problems of 2 items written on the left is to be examined case by case.	Owner As necessary	1.Resident 2.Real estimate agency	
VIII	Review	Income from rent	1.Income from rent 2.Result of inspection of the defective parts of the apartment house	1.Return of dept 2.Decision of whether or not the defect ive parts can be repaired or replaced	1.Report for taxes. 2.Appropriately maintained apartment house.	1.Manage so that there are no vacancies(O,A)		Owner As necessary		

Fig.2.2-7 Example of steplist management

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Fig. 2.2-8 Correspondence between the faultless four frames, PERT and ability of the left and right brains

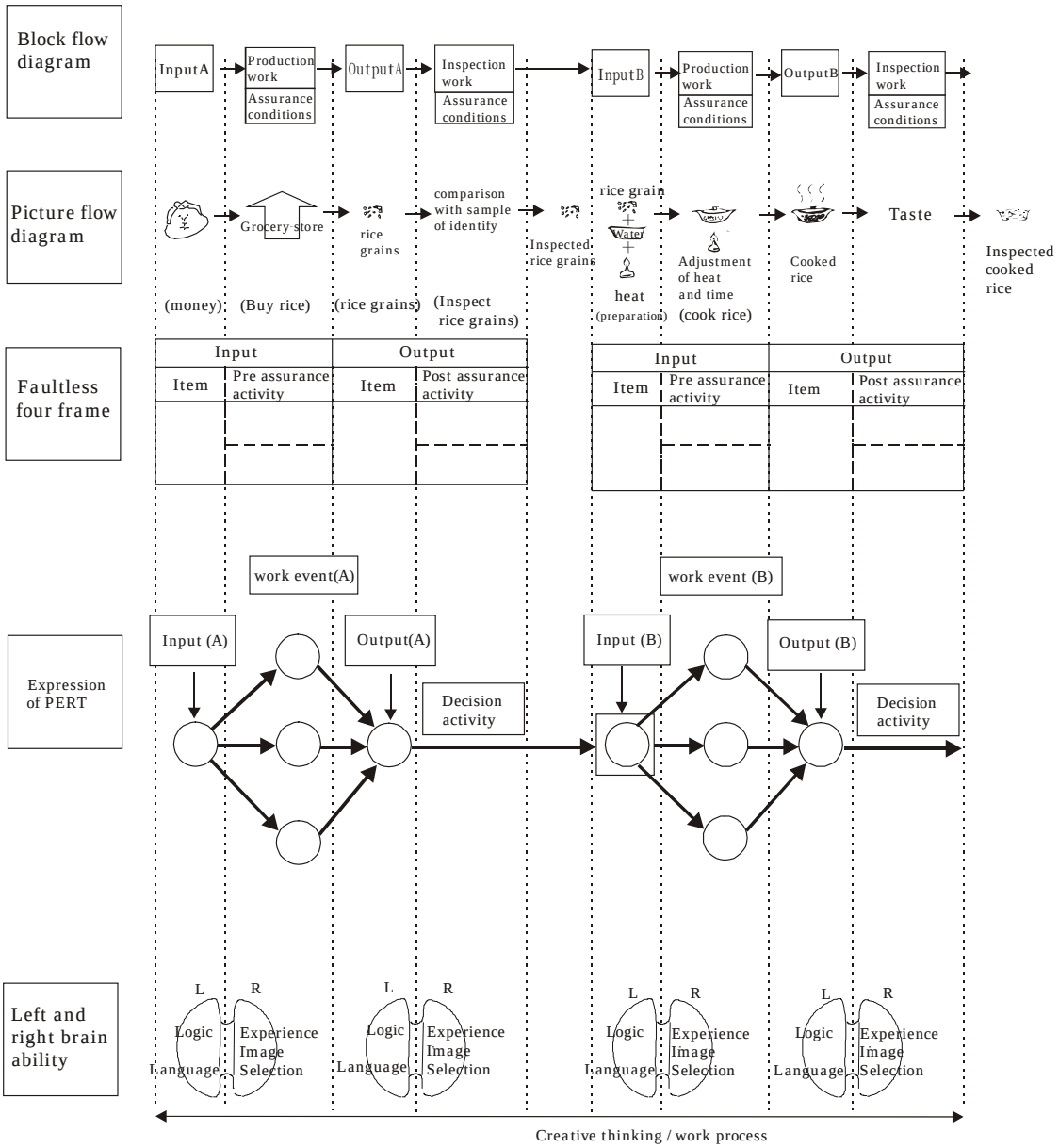

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Fig. 2.2-9 Correspondence of language sequence between English and Japanese

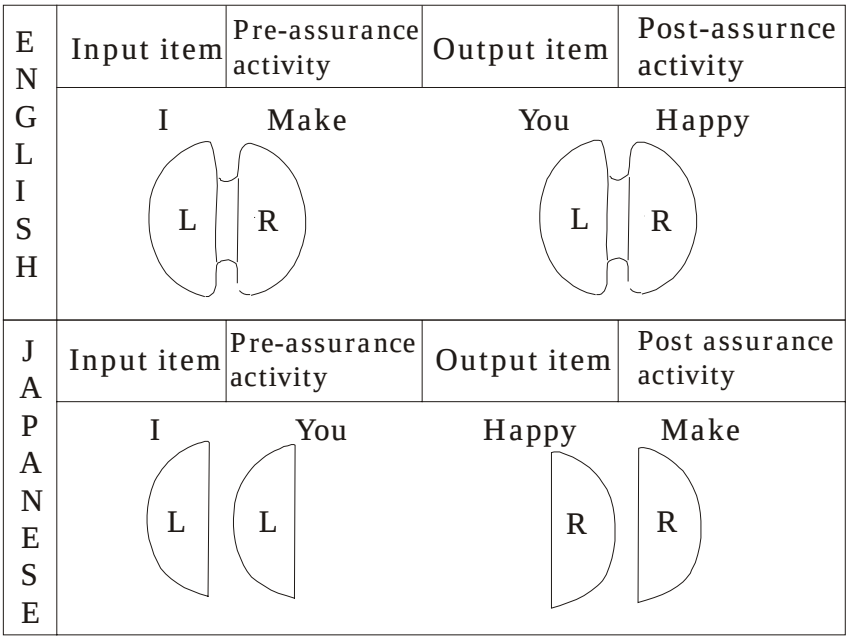

Fig 2.2-10 English and Japanese information flow inside the brain