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PROGRESSIVE AND DEGENERATING PROBLEMSHIFTS OF ORGANIZATION

— Rational Reconstruction of Organizational Form based on Critical Rationalism —

by

*Kenshu Kikuzawa**

Abstract

Generally speaking, a historically newer organizational form is often regarded as a logically better form. However, if the development of organizational form is rationally reconstructed based on K.R. Popper's methodology of science, the change to a newer style like matrix form or "Bunsha" form is degenerating rather than progressive. Thus, a historically newer form is not necessarily better from a logical point of view. To prove this, in this paper, first, we explain Popper's schema of the growth of knowledge. Second, on the basis of his schema, we reconstruct progressive and degenerating problemshifts of organization. Finally, we show some examples of its application to some Japanese companies.

Key Words

critical rationalism; rational reconstruction; tetradic schema; progressive problemshift; degenerating problemshift; organizational form; line form; functional form; multidivision form; quasi-multidivision form; matrix form; Bunsha form

1. Introduction

A widely accepted view in Japan explains the development of organizational form in the following stages (Sakakibara [S2] pp.71-79.):

(1) Functional form emerged first;
(2) Then, multidivision form was adopted;
(3) Thereafter, many companies have moved to matrix form (including Strategic Business Unit).
(4) Recently, the more decentralized form like Bunsha form (a new form developed by Matsushita Electric Corporation) or Ameba form (a new form developed by Kyosera, a Japanese Ceramic manufacture) is quite popular.

The problem here is whether this development is a logical consequence of progressive process or only a historical stream of booms. Often it is ignored that there is a difference between historical facts and logical things, and a historically newer form is often seen as a logically better form.

Nevertheless, a historically newer form is not necessarily better from a logical point of view. Even if a form is historically new, it might be logically ineffective. For example, according to our analysis, the change to a newer style like matrix organization is degenerating rather than progressive, contrary to the accepted view.

To prove this, we attempt to reconstruct the process of development of organizational form from a logical point of view. The basis of this reconstruction is the schema of the growth of knowledge developed by K.R. Popper. Through this reconstruction, we shall prove that a historically newer form is not always effective or useful.

Therefore, in this paper,

(1) First, we explain Popper's critical rationalism and his schema of the growth of knowledge via conjectures and refutations.
(2) Second, we will reconstruct progressive and degenerating problemshifts of organizational form on the basis of Popper's schema.
(3) Finally, in order to show the effectiveness of this rational reconstruction, we show some examples of its application to some Japanese companies.

Through this process, it is expected that this sheds light on the study of organizational form.

2. *Critical Rationalism as a Basic Principle*

2-1. Critical Rationalism's View of Science

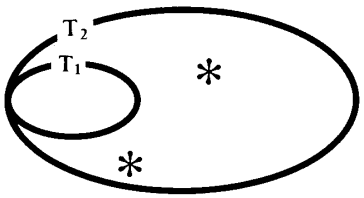
First of all, we explain briefly the essence of Popper's philosophy of science, usually referred to as the 'critical rationalism' (see Popper [P1], [P2], [P3], [P4]). Popper demonstrated that an infinite number of singular statements could be derived logically from a universal statement. Thus, if we try to verify the universal statement, we must verify all of those singular statements by means of an infinite number of observational data.

However, this procedure is clearly impossible. We can not verify even the simplest statement such as "all ravens are black". For the reason, we can not argue that the universal statement is true. In contrast to it, we can falsify logically the universal statement by counterevidence. For example, the universal statement "all ravens are black" can be falsified by discovering (or finding out) only one white raven.

Thus, we can not verify the universal theory, but can falsify it; that is, there is asymmetry between verification and falsification. We can not decide that the universal theory is ture. We must therefore admit that all human being are ignorant. In this context, scientific method is seen as follows:

(1) Any theory that can be interpreted as experimentally falsifiable is 'scientific'.
(2) Even if the theory is put to the test and survived it, it does not mean the theory proven to be true, but it is only temporarily accepted, since we have found no reason to discard it.
(3) But if the theory is falsified by an 'observational' statement which conflicts with it, we should try to search for a new theory that explains past events as well as newly found ones.
(4) If such a theory is discovered, this means a progress in scientific knowledge.

This can also be shown in Figure 2-1. We say that there is a progress in our knowledge



T_1 : Old Theory
T_2 : New Theory
* : Counterexample

Figure 2-1

if and only if a new theory has been proposed with the following characteristics:

(1) A new theory (T_2) has excess empirical content over the old theory (T_1); that is, it predicts new facts that was unable with (T_1).
(2) (T_2) explains the previous success of (T_1); that is, all the unrefuted content of (T_1) is included in the content of (T_2).
(3) Some of the excess content of (T_2) are corroborated.

2-2. Schema of the Growth of Knowledge

Popper claims that the progressive process in scientific knowledge from the old theory (T_1) to new one (T_2) can be represented as a general tetradic schema. It is shown in Figure 2-2. (Popper [P4] P.287. Sakakibara/Kikuzawa [S1], Lakatos [L1] p. 118)

$$\ldots P_1 \longrightarrow TT_1 \longrightarrow EE \longrightarrow P_2 \ldots$$

Figure 2-2

Here (P), (TT), and (EE) stand for respectively, 'problem', 'tentative theory' and 'error-elimination'. The schema indicates that,

(1) if we can, we should propose a theory (TT_1) as an attempt to solve some given problem (P_1),
(2) we should critically examine (EE) our tentative solution (TT_1), and
(3) error-elimination (EE) necessarily implies the emergence of a new problem (P_2).

Here,

(a) if the new problem (P_2) turns out to be merely the old one (P_1) in disguise, then we say that the theory only manages to shift the problem a little; therefore it is taken as a decisive objection to our tentative theory (TT_1). In this case, we say that the problemshift is degenerating.
(b) If (P_2) is significantly different from (P_1), then we say that the problemshift is progressive. If this is the case, we learn a new thing. (Popper [P4] P. 288.)

2-3. Application of the Schema

Popper insists that the schema is applicable not only to the emergence of new scientific problems but to the emergence of new forms of behavior, and even to forms of

living organisms (Popper [P4] P. 288.). As Popper says, "it can interpreted as a description of biological evolution". "Animals, and even plants, are problem-solvers". "They solve their problems by the method of competitive tentative solutions and the elimination of errors." (Popper [P4] p. 145)

In this case, the schema is interpreted as follows:

(1) Human behavior is a tentative solution (TT) of some given problem (P_1).
(2) Human behavior as a tentative solution (TT) is tested whether it in fact solves the problem (P_1).
(3) The result of error-elimination (EE) is usually the emergence of a new problem (P_2).

In a similar way, we think that the schema can also be applied to the form of organization. In this case, this schema is interpreted as follows:

(1) Organizational form is a tentative solution (TT) of some given problem (P_1).
(2) Organizational form as a tentative solution (TT) is tested whether it in fact solves the problem (P_1).
(3) The result of error-elimination (EE) is usually the emergence of a new problem (P_2).

Using this, we can determine whether the change of organizational form is progressive or degenerating as follows:

(a) If the new problem (P_2) turns out to be merely the old problem (P_1) in disguise, then we say that the problemshift is degenerating.
(b) If (P_2) is essentially different from (P_1), then we say that the problemshift is progressive.

3. Rational Reconstruction of Organizational Form

First, we explain the progressive problemshifts of organization according to the principle stated in the previous section. Then, the degenerating problemshifts of organization is reviewed from the same viewpoint.

3-1. Progressive Problemshifts to Multidivision Form

(a) Line Form

The simplest form of organization is the line form. It is shown in Figure 3-1. The advantages are pointed out as follows:

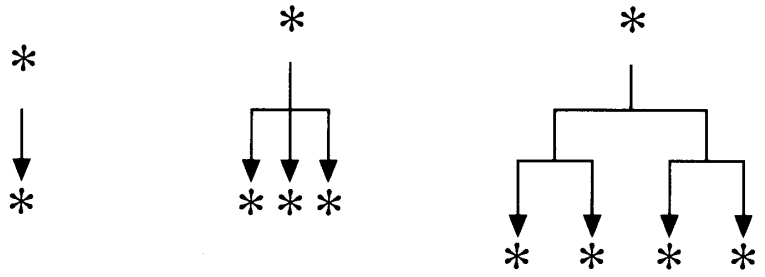


Figure 3-1

(T_L) Since the channel of command is unified, neither inconsistency nor conflict results from the plurality of the channel of command.

(T_L) From the same reason, where the responsibility lies is always clear.

However, along with the growth, the growth itself acts as a criticism against the prearranged organizational form. Generally, the following problem results from the line form.

(P_L) The limitation of managerial ability of a manager becomes prominent. Specifically, the limitation takes the following forms:

(P_{L-1}) The managers come to be unable to deal efficiently with the information ranging over the entire firm.

(P_{L-2}) The managers can no longer make use of the managerial resources from the overall point of view.

Thus, if a firm continues to grow under the line form, it necessarily results in an ineffective organizational situation.

(b) Naive Functional Form

To solve the problems stated above, the functional form was proposed by F.W. Taylor. This organizational form is characterized by the fact that it is functionally divided, and also that the authority is delegated to the divided units. This is shown in Figure 3-2. The problem with the line form can be resolved by this organizational form, and the advantages are described as follows:

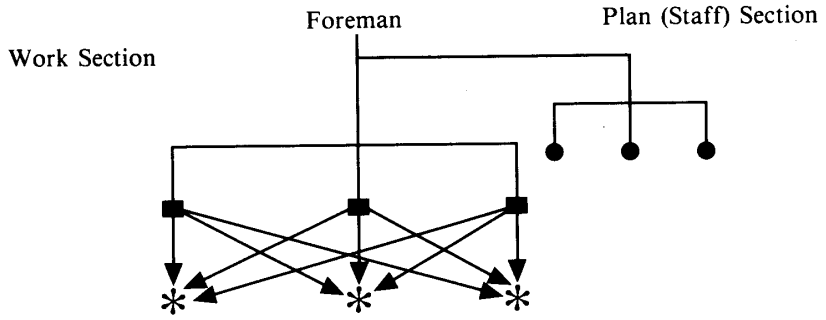


Figure 3-2

(T_F) The responsibility a manager assumes can be reduced by specialization and delegation of authority.

(T_F) Also, efficiency results from specialization and delegation of authority.

(T_F) Moreover, managerial resources can be used efficiently under this organizational form.

However, since managers do their job mainly from a functional point of view, the following problems will eventually show up.

(P_F) Conflict occurs between various functional commands and their authority. Specifically, this basic problem takes the forms of the following:

(P_{F-1}) Since the channel of command is plural, the subordinates are puzzled with the inconsistency of the divergent and somewhat conflicting commands.

(P_{F-2}) By the same reason, the presence of the responsibility becomes unclear.

(c) Sophisticated Functional Organization (Line and Staff)

In order to solve the above problems, the line and staff form, which we call the

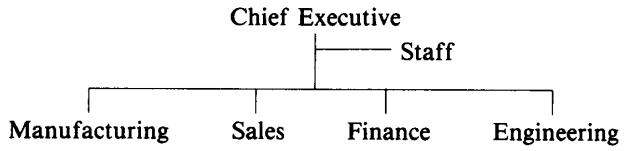


Figure 3-3

'sophisticated functional form', is developed. This is shown in Figure 3-3. This form is proposed to take the advantages of both line and naive functional forms of organization. In this form, the organization is functionally divided, authority is delegated to some extent and the channel of command is unified. Thus, the problems with the naive functional form are solved by this organizational form. Especially, the advantages of the latter can be described as follows:

(T_{SF}) Since the channel of command is unified, inconsistency of commands from various sources does not occur.

(T_{SF}) By the same reason, who takes the responsibility is always clear.

(T_{SF}) The burden of responsibility of a manager can be reduced by specialization and delegation of authority.

(T_{SF}) Working is effective through specialization and delegation of authority.

(T_{SF}) Managerial resources are used effectively by specialization and delegation of authority.

However, if a firm continues to grow under this organizational form, the growing itself becomes a criticism against this form. The following problems, which are the mixture of the problems of both line and functional forms, result from the sophisticated functional form. These are:

(P_L) The limitation of managerial ability of management including the staff appears.

(P_F) Conflict occurs between staff and worker or between each functional command and authority.

(d) Multidivision Form

In order to solve the problems with the line and staff organizated form, the multidivision form is developed. This is shown in Figure 3-4 (Williamson [W1] p. 138).

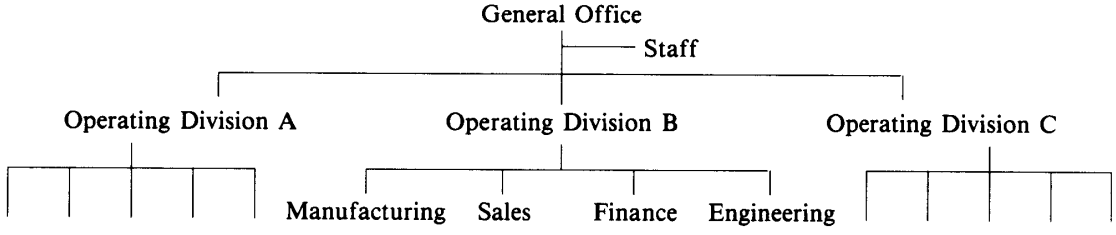


Figure 3-4

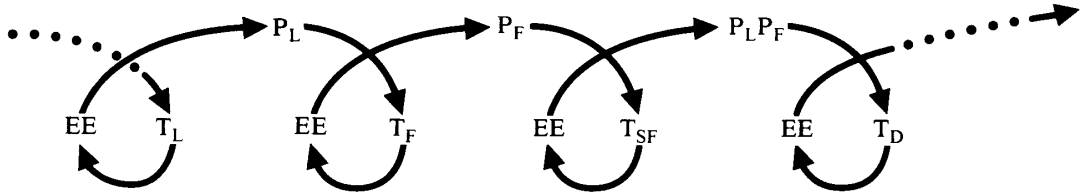
Necessary and sufficient conditions for establishing this multidivision form are explained as follows: (Williamson [W1] p. 152)

(T_D) Strategic decision-making is clearly separated from operational one. (decentralizaton)

(T_D) The requisite internal control system has been established for evaluating the performance of each division. (Centralization)

Under this form, the burden of the head office is clearly reduced by decentralization and delegation. Furthermore, since each division is given autonomy, there will be no conflict between each division. Also, since each divisional behavior is evaluated by the head office, the allocation of managerial resources (man, material, money) in the firm is effective and adapted to environment.

The above problemshifts to multidivision form clearly solve new problems as shown in Figure 3-5. Thus we conclude that the problemshifts in this case are progressive.



T_L : Line Form
T_F : Naive Functional Form
T_{SF} : Sophisticated Functional Form
T_D : Multidivision Form
EE : Criticism
P_L : Problem of Line Form
P_F : Problem of Naive Functional Form
$P_L P_F$: Problem of Sophisticated Functional Form

Figure 3-5

However, in fact, the problems of the sophisticated functional form are not always solved completely. For example, even if the multidivision form is superficially applied, it may not work well. It is logically deducible that there are two kinds of quasi-multidivisions as follows:

(T_{QD1}) multidivision where the control power of the head office is not so strong.
: Under such circumstances, each division is given autonomous standing in a high degree.

(T_{QD2}) multidivision where the control power of the head office is very strong.
: In such a case, each division is scarcely given autonomy.

The case of the degenerating problemshift will be explained by analyzing these quasi-multidivisions in the next subsection.

3-2. Degenerating Problemshift to Matrix Form

(e) Quasi-Multidivision Form 1

First, assume that a firm under the functional form is suffering from the following problems:

(P_L) The limitation of managerial ability of management has emerged.

(P_F) Conflicts occurred between staffs and workers or between various functional commands and their authority.

Assume further that in order to solve these problems, the firm shifts to the quasi-

multidivision form as follows:

(T_{QD1}) Operational decision-making is separated from the strategic one, and the authority of decision-making is much delegated to the lower level divisions. (Decentralization)

(T_{QD1}) Internal control system for evaluating each division has not yet been established. (Non-centralization)

In this case, since the head office can not control all the behavior of each division, it can not make effective use of the managerial resources in this company. In other words, the firm continues to suffer from the same old problem (P_L) as the case of functional form; either the quasi-multidivision form can not solve the problems with the sophisticated functional form. Thus this type of form scarcely shifts the problem at all.

(f) Matrix Form

To solve the above problem, matrix form was developed as a possible solution in the United States of America. The matrix form is constructed on the basis of two axes. For example, as shown in Figure 3-6, organization is on the basis of the functional-business axes or of the operating division-strategic business unit axes.

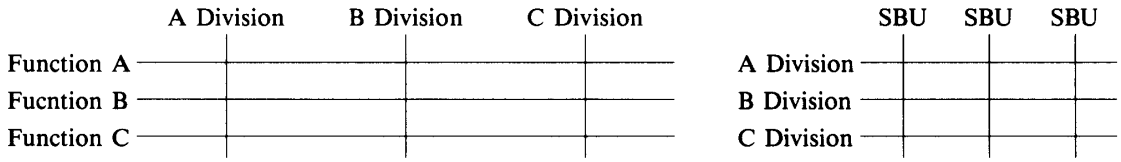


Figure 3-6

Nevertheless, if we analyze the structure of communication and authority in the matrix form, it is clear that it is essentially identical to the functional form as shown in Figure 3-7.

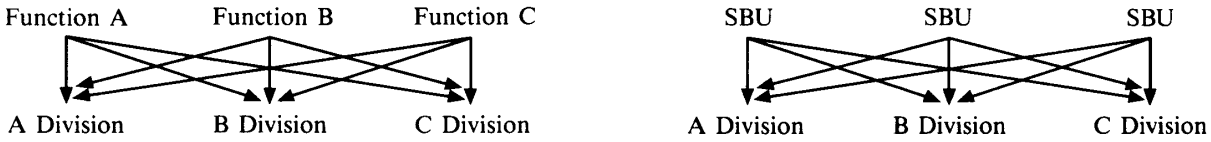
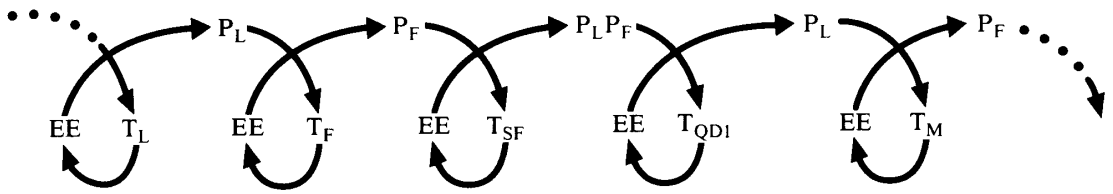


Figure 3-7

As you can see, since either this matrix form can not solve the problem stated in paragraph (b) of the previous section 3-1, it also suffers from the same old problem (P_F). Accordingly, the matrix form may partially solve the problems with the functional form, but at the same time, it may evoke the other problems.

From a historical point of view, the above problemshifts to matrix form are shown in Figure 3-8. However, this Figure 3-8 can be logically rewritten as shown in Figure 3-8'. As we can see in this Figure 3-8', the problemshifts are logically circulating: that is, this change of organizational form scarcely shifts the problem at all. Thus, contrary to the widely accepted view, we conclude that the problemshifts in this case are degenerating.



T_L : Line Form
T_F : Naive Functional Form
T_{SF} : Sophisticated Functional Form
T_{QD1} : Quasi-Multidivision Form
T_M : Matrix Form
EE : Criticism
P_L : Problem of Line Form
P_F : Problem of Naive Functional Form
P_LP_F : Problem of Sophisticated Functional Form

Figure 3-8

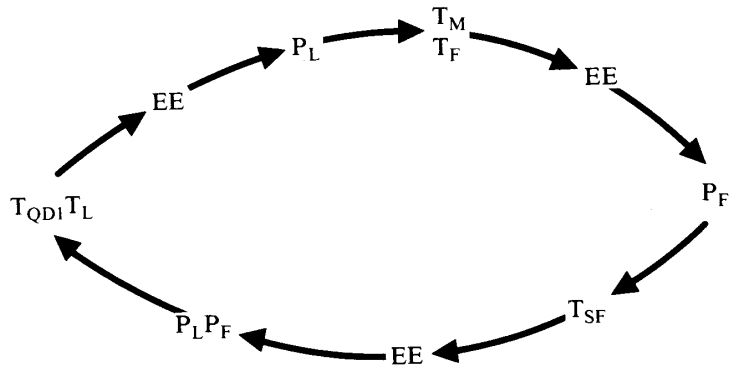


Figure 3-8'

3-3. Degenerating Problemshift by "Bunsha" Form

(g) Quasi-Multidivision Form 2

Assume that, in order to solve the problems associated with the sophisticated functional form, the firm shifts to the other quasi-multidivision form characterized by the following:

(T_{QD2}) Internal control system for evaluating each division has been established. (Centralization)

(T_{QD2}) Strategic decision-making is not clearly distinguished from operational one. (Non-Decentralization)

In this case, since the head office in the firm is not enough powerful to direct all operating and strategic decision-making processes, the same problem (P_L) arises as stated in the paragraph on the "line form" [3-1 (a)].

(h) "Bunsha" Form

To avoid the problem above mentioned, the notion of "Bunsha (divided firm)" form was proposed in Japan. This can be characterized as follows (Sakamoto/Shimotani [S3].):

(T_B) In order to maintain the quasi-multidivision form where the control power of the head office is strong, part of the divisions are separated as Bunsha from the head office's control, and each Bunsha is given autonomy, while the rest of the divisions are still under direct control of the head office as shown in Figure 3-9.

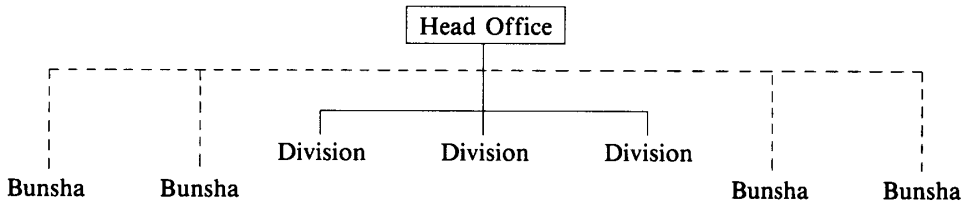
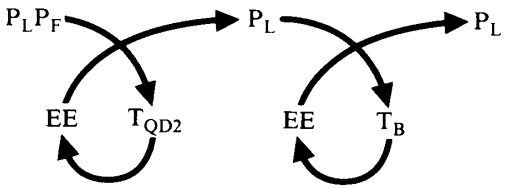


Figure 3-9

In this way, the managerial control power of the head office is temporarily maintained.

However, this organizational form slightly shifts the problem, because it does not completely solve the problem with the quasi-multidivision form, that is; as stated in the section 3-1 (a), if the firm grows under the "Bunsha" form, the head office will eventually suffer from the same problems (P_L).

The historical change to Bunsha form is shown in Figure 3-10.



T_{QD2} : Quasi-Multidivision Form
T_B : Bunsha Form
EE : Criticism
P_LP_F : Problem of Sophisticated Functional Form
P_L : Problem of Line Form
P_F : Problem of Naive Functional Form

Figure 3-10

However, this Figure 3-10 can be further rewritten in Figure 3-10' from a logical point of view.

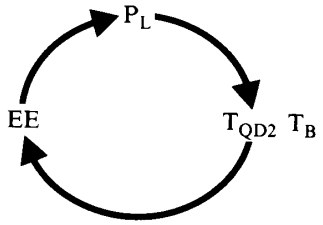


Figure 3-10'

As we can see in Figure 3-10', the problemshift is also cyclical: that is, this change from quasi-multidivision form to Bunsha form scarcely shifts the problem. Again, contrary to the common view, we conclude that the problemshift is not progressive, but rather degenerating.

4. A Case Study

In this section, we review several cases of Japanese companies from the viewpoint of progressive/degenerating problemshifts of organizations. Readers are referred to Okita [01] for Mitsubishi, Kitano [K1] for Oki, and Sakamoto/Simatani [S3] for Matsushita.

4-1. Mitsubishi Heavy Industries Corporation

Mitsubishi Heavy Industries Corporation was established in 1964 merging three independent companies within the Mitsubishi group. The product line of these three companies was much the same. Just after the merger, the organization of the new company was nothing but the union of three different companies. In other words, the established organizational form of Mitsubishi was not divided functionally; it was a kind of line form. Thus the typical problems of the line form came up along with the growth of the firm as stated in (P_L), ($P_{L\text{-}1}$), ($P_{L\text{-}2}$) of section 3-1 (a).

To solve these problems; that is, to use resources more efficiently, Mitsubishi moved to the matrix form organization which was constructed on the axes of production-oriented division and sales division as indicated in Figure 4-1.

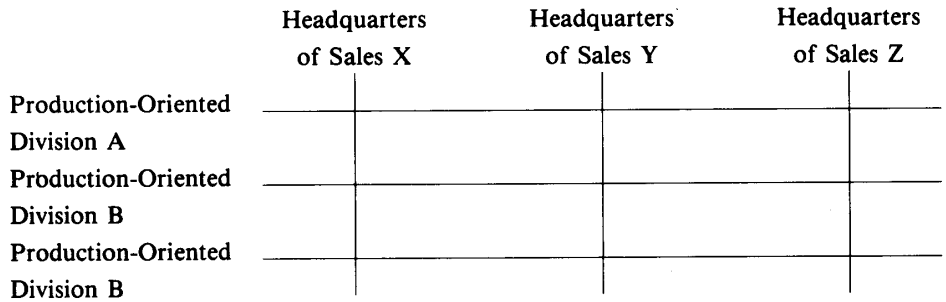


Figure 4-1

Analyzing the structure of command and communication in the matrix form, we can safely say that the matrix form is equivalent, in its nature, to functional form. Thus, exactly the same problems (P_F), ($P_{F\text{-}1}$), ($P_{F\text{-}2}$) arise under the matrix form as they did under the functional organization.

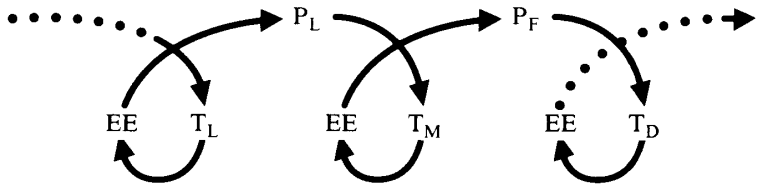
However, to solve these problems, Mitsubishi further attempted to change its organizational form gradually from the matrix form to the multidivision form as follows:

(T_D) The production divisions and the sales divisions were unified, with each of the unified unit negotiating with the head office and staff.

(T_D) The system of financial control was established; that is, under this system the headquarters finances each division when the latter needs capital money, on

condition that interest be paid for positive return and penalty for negative return.

In this way, Mitsubishi always tried to solve new problems by building up new organizational forms as indicated in Figure 4-2. The problemshift in this case is progressive from a logical point of view as well as from a historical point of view.



T_L : Line Form
T_M : Matrix Form
T_D : Multidivision Form
EE : Criticism
P_L : Problem of Line Form
P_F : Problem of Functional Form

Figure 4-2

4-2. Oki Electric Industry Corporation

Oki Electric Industry Corporation began to review its organizational design with the Oil Shock in 1973 as a turning point. The proposed design at that time was the functional form which was made up of several functionally divided departments. At those days, Oki was already aware of the general problems (P_F), (P_{F-1}), (P_{F-2}) associated with the functional organization [see Section 3-1 (b)]. Thus, to solve them contemporary with the Oil Shock, Oki began to search for a new organizational design.

As a result, Oki moved to matrix form. The new form was a sort of dual matrix; that is, a matrix on company level and a matrix on division level. The matrix on company level was reconstructed on the basis of the axis of division and the axis of function in the head office as indicated in Figure 4-3.

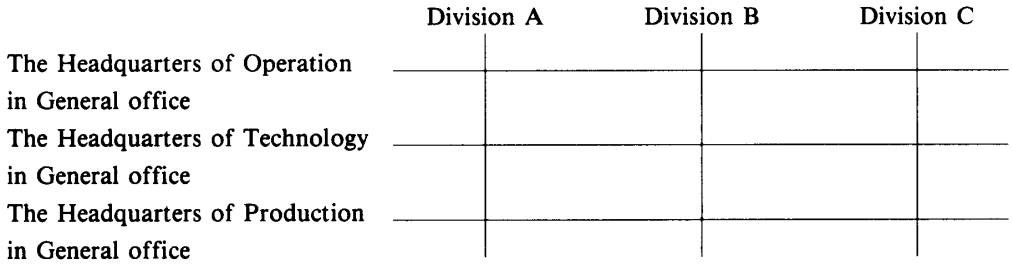


Figure 4-3

The matrix on division level was made up on the basis of the axis of SBU (Strategic Business Unit) and the axis of function in each division as indicated in Figure 4-4.

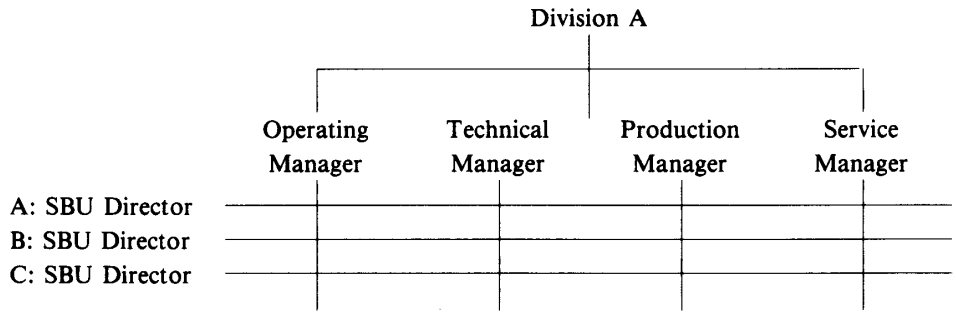
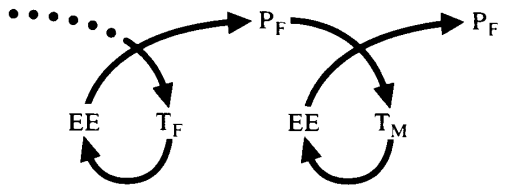


Figure 4-4

Here, if we analyze the structure of command and communication in this matrix form, it is clear that the matrix form is nothing but the functional form. Thus, the general problems (P_F), ($P_{F\text{-}1}$), ($P_{F\text{-}2}$) with the functional organization eventually occurred.

Although Oki recognized these problems, they expected that this form might build the new organizational culture which was ultimately profitable for the firm. For this reason, Oki still stayed in this form. Such a problemshift from functional form to matrix form at Oki is shown in Figure 4-5 from a historical point of view.



T_F : Functional Form
T_M : Matrix Form
EE : Criticism
P_F : Problem of Functional Form

Figure 4-5

However, from a logical point of view, further this Figure 4-5 can be rewritten in Figure 4-5'.

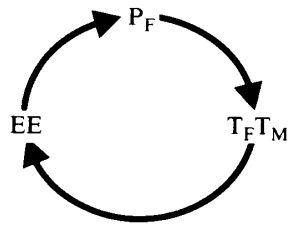


Figure 4-5'

As we can see, this problemshift at Oki is cyclical from a logical point of view: that is, Oki did not solve any problems with the organizational form, only managed to shift

the problem a little. The problemshift at Oki is determined to be degenerating.

4-3. Matsushita Electric Industrial Corporation

Matsushita had relatively earlier moved to the multidivision form in Japan before World War II. Nevertheless, in fact, all divisions were still under direct control of the chief executive; therefore, the form was a kind of quasi-multidivision form. For the reason, when Matsushita grew up and the number of divisions increased, it had inevitably come across the general problems (P_L), ($P_{L\text{-}1}$), ($P_{L\text{-}2}$) associated with the line form.

In order to solve these problems, Matsushita tried to reduce the number of divisions as much as possible. Nevertheless, as a result, it could not completely solve the problems. Thus, Matsushita moved to Bunsha form on which Japanese scholars had set a high value. The characteristic feature of the Bunsha form is as follows:

(T_B) In order to maintain the quasi-multidivision form under the very strong control power of the head office, part of the divisions are separated from the head offices' control and given autonomous position as the Bunsha, while the rest of the divisions is still under direct control of the head office. It is shown in Figure 4-6.

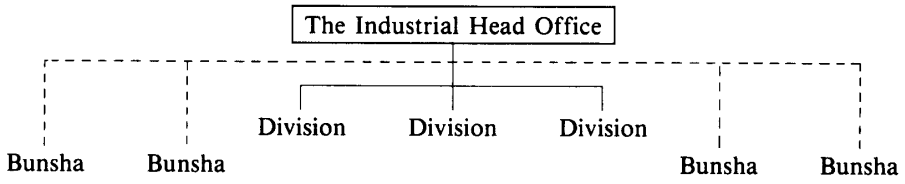
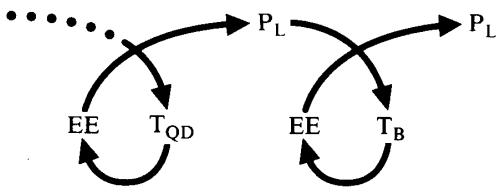


Figure 4-6

However, this is only a quasi-solution; therefore, it only slightly shifts the problem because the head office bears again the same problem when the number of divisions under direct control increases.

This problemshift to Bunsha form at Matsushita is shown in Figure 4-7 from a historical point of view.



T_{QD} : Quasi-Multidivision Form
T_B : Bunsha Form
EE : Criticism
P_L : Problem of Line Form

Figure 4-7

However, from a logical point of view, this Figure 4-7 can be rewritten as 4-7'.

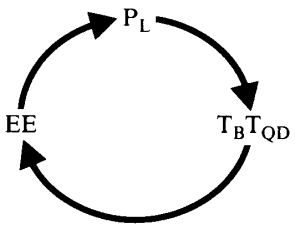
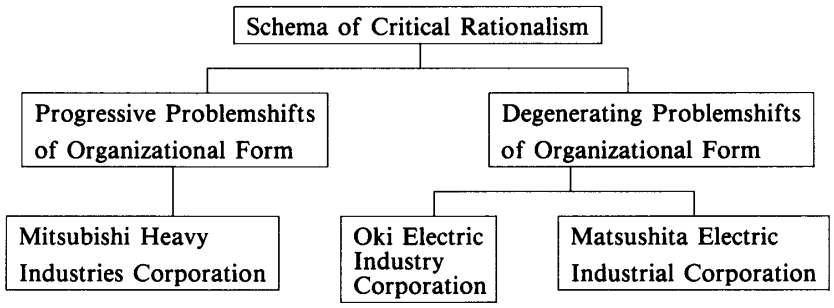


Figure 4-7'

As we can see, the problemshift at Matsushita is circulating: that is, Matsushita managed to shift the problem only a bit. We conclude that the problemshift in the case was degenerating.

5. *Conclusion*

In this paper, first, we explained Popper's critical rationalism and his schema of the growth of knowledge via conjectures and refutations. Second, we reconstructed progressive and degenerating problemshifts of organizational form on the basis of Popper's schema. Finally, in order to show the effectiveness of this rational reconstruction, the application of the theory to some Japanese companies was made.



As we have seen in this analysis, the change to a new style like matrix organization or "Bunsha form" is degenerating rather than progressive, contrary to the accepted view. Thus, we conclude that the historically newer form is not necessarily logically right. We think that this study sheds light to the study of organizational form. Besides, though researchers as well as companies have tended to receive easily the newest organizational form developed in the United States of America, Germany and Japan without any serious critical discussion, our study is expected to ring an alarm bell to this trend.

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