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FINDINGS AND INTERPRETATIONS OF THE 1983 FIELD RESEARCH IN TOYOTA

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I. *The Purposes of the Research*

The research team has pursued the case study in Toyota Motor Corporation in accordance with the research objectives set by OECD/CERI.[1]

The research team has understood the purpose of the research in the following way: In the rapid stream of technological changes, it is expected that the contents and methods of work and the work organization has been, and will be, changing greatly, and at the same time that the occupational structure of employees within the company is also changing.

Then, the research team has focused upon the actual state of blue collar workers and white collar employees of Toyota in order to answer the following questions; which kind of educational and training policies does the company plan and implement to adapt employees to the technological changes?; how does the company change the form and contents of work and the work organization? and; how does the company effectively utilize the human resources trained within it?

II. *The Method of the Research*

A. Selection of the Research Object

The research team has selected as the research object Stamping Operations, Body Manufacturing Department of Tsutsumi plant and Stamping Engineering Staff, Body Manufacturing Engineering Department. Body Manufacturing Department of Tsutsumi plant consists of Stamping Operations, Body Operations and Engineering Service Staff. In the departmental office which is located next to the plant, a general manager, a manager, engineers, foremen, and staff for education and training have their desks. Body Manufacturing Engineering Department is located in Motomachi plant.

[1] The research was organized for "Human resources development and new technology" for Center for Educational Research and Innovation, OECD. The members are Masumi Tsuda (Chief), Shoyu Kishida and Michio Fujiwara.

B. Procedure and Duration of the Research

The research has been executed in the following procedure.

(1) Preparation of the research (April, 1983)

Education and Training Department, which has prepared the company report of Toyota, has played the role of liaison agents for the research team, and has given the team the full cooperation in setting the interviews with people concerned and executing questionnaire survey.

The following personnel was interviewed during the preparation stage; a Senior Managing Director in charge of Personnel and Labor Relations Department and Education and Training Department; a Director and General Manager of Education and Training Department; a Director in charge of Body Manufacturing Engineering Department; and a Director and General Manager, Tsutsumi plant.

(2) Interviews with staff in Education and Training Department (whole period)

Two Assistant General Managers, two Managers, and three Assistant Managers.

(3) Interviews at Tsutsumi plant (May–August, 1983)

The following personnel was interviewed once to several times during the period.

Line Organization of Body Manufacturing Department;

a General Manager of the Department
a Manager of Stamping Operations,
twelve Foremen of Stamping Operations,
nine Assistant Foremen of Stamping Operations,
six Playing Leaders of Stamping Operations,
and twelve rank-and-file workers.

(Rank-and-file workers interviewed consisted of those in stamping lines, die-change teams, forklift drivers' teams, die-maintenance teams, machine maintenance teams, inspecting job, new-model preparation team, and cost-reduction team.)

Staff Organization of Body Manufacturing Department;

a Manager of Engineering Service Staff,
six engineers in charge of Stamping Operations, Engineering Service Staff, and
three staffs of education and training in Body Manufacturing Department (one of whom is an ex-foreman and now in charge of QC circle activities and suggestion system, and the rest of whom are playing leaders in charge of education of students of Toyota Technical High School and human relations activities).

Staff Organization of Tsutsumi plant;

a technical counselor (who used to be a foreman and a manager afterward),
a Manager of Administration Staff, Tsutsumi plant, in charge of QC circle activities, and
a Manager, an Assistant Manager, and two Assistant Foremen of Machinery Maintenance Operations of Adnimistration Department, Tsutsumi plant.

Labor Union Officials;

three shop committeemen of Stamping Operations.

(4) Interviews with staff of Body Manufacturing Engineering Department (October, 1983 and March, 1984)

A Manager and an Assistant Manager of Stamping Engineering Staff.

(5) Questionnaire survey on Stamping Operations of Tsutsumi plant and Stamping Engineering Staff of Body Manufacturing Engineering Department (November–December, 1983)

Workers of Stamping Operations	380
Engineers of Engineering Service Staff	20
Engineers of Stamping Engineering Staff, Body Manufacturing Engineering Department	70

(6) Attendance of four occasions of exhibitions under the auspices of Education and Training Department and Safety and Health Administration Department

(7) Collecting materials

During the whole period, the research team collected educational materials made by Education and Training Department and other related departments, and various kinds of materials whether in a publication form or other.

C. Contents of Interviews

The contents of interviews can be classified into the following headlines; the development of stamping technology in Toyota, particularly focused upon the time of establishment of Tsutsumi plant (1970), and the innovation just after the Oil Crisis (1975); the level of the present stamping technology; the difference of the technology between the old one and the present one; the change of production technology; the process of rationalization; the change of work patterns and the reorganization of work groups; the education and training at the introduction of new technology; the present system of education and training; the development of the system of education and training; the changes in work contents; the development of human resources; and the effective utilization of the human resources. The process of acquiring skill in each job category was particularly focused upon by the research team.

Based upon the results of interviews and the analysis of collected materials, the research team designed the questionnaire and conducted survey upon the research object. The questionnaire was carefully designed, in collaboration with Educational and Training Department, in order to clarify the adaptation of workers and engineers to the introduction of new technology.

III. *The Findings of the Research*

(The research team has chosen to describe the findings in detail so that foreigners can understand and visualize the on-going practices in Toyota. The full contents of the research report are listed in Appendix 1.) The summary of the findings is as follows.

A. Development of the Production System

It is observed that Toyota, introducing new technologies at any time, has developed and adopted the single-digit die-change system and "kanban" method in order to realize the production system which makes possible multi-item small-lot production of automobiles

of high quality with efficiency in a stamping shop. It is also found that various kinds of improvements, based upon the single-digit die-change and "kanban" method, have been tried and devised.

B. Maintenance of Flexible Work Groups

It is observed that the management has been making efforts to maintain the flexible system of work groups in face of the on-going technological changes. It must be noted that the management has tried to adapt the team, the basic unit of production, to the changing production volume, seeing to it that an individual worker does not do a simple or an isolated work.

C. Web-like System of Education and Training

It is observed that the management has been making wide and deep efforts to adjust the system of the continuous education and training, based upon job rotation and on-the-jon training, in order to cope with the technological changes and to make possible the flexible work assignment of an individual worker who is a member of a work team, the basic unit of work organization.

It is also noted that the accumulation of skill proceeds through the introductory education of new comers and polyvalent education and training for the multi-functionalization of workers, and that various off-the-job training has been implemented for the workers to acquire the new technologies.

As Table 1 shows, Toyota has adjusted the web-like system of education and training.

TABLE 1. EDUCATION AND TRAINING IN TOYOTA

Contents	Dep't in Head Office	Plant	Section
Job Rotation	Personnel & Labor Relations Dep't	Personnel Staff	Managers, Foremen
Education & Training in general	Education & Training Dep't	Personnel Staff	Managers, Staff
Safety Driving	General Adm. Dep't	Personnel Staff	Managers, Foremen
QC	TQC Promotion Office	Personnel Staff	Staff
In-plant Qualifications	Safety & Health Adm. Dep't	Safety & Health Adm. Staff	Engineering Service Staff
Suggestion System	Production Engineering Planning Staff Office	Personnel Staff	Staff
Specific Technology	Engineering Dep't		Engineering Service Staff
Safety & Health	Safety & Health Adm. Dep't	Safety & Health Adm. Staff	Managers, Foremen
Production and Delivery	Production Control Dep't	Scheduling Staff	Manager, Engineering Service Staff
Cost Management	Accounting Dep't	Adm. Staff	Managers, Engineering Service Staff
Preventive Maintenance	Production Engineering Planning Staff Office	Machinery Maintenance Operations	Engineering Service Staff
Guidance of Dorm. Residents	Housing Adm. Staff		Staff

D. Efforts of Employee Integration

It is noted that management has been making efforts to integrate the employees who have different values and needs for scores of years. Namely, group activities such as QC circle activities, and individual activities such as suggestion system come to be in close relations with other activities in a plant through a variety of competitions. And the study groups are organized, for the purpose of multi-functionalization, like a cob web. As a result, the shop floor has the character of "Studying Group."

It is also observed that the management positively supports employees' voluntary athletic or cultural activities, which amount to a few hundreds, and that it helps and assists the employees to pursue a quality of working lives and leisure time.

E. Shop-floor Activities of a Union

It is observed that the needs and demands at the shop-floor can fully go up to the upper level of a union, while the attendance rate of rank-and-file members at the shop meetings is high. The union sees the present form and contents of work and the present system of education and training in the affirmative. At the same time the union always pays attention to the equitable treatment of its members by the management.

IV. *The Interpretations of the Research Results*

When evaluating the research results, the research team discussed the comparability of the management in Japan and that in the Western countries. Western writers and scholars claim that Japanese management does not share the same concepts with Western management, looking at the rapid growth, the maintenance of high quality, and the realization of low price resulting from rationalization in Japanese automobile industries. Is this true? Has only Japanese management developed in the different line from Western countries, and will it develop into different direction?

W. J. Abernathy and K. B. Clark of the Harvard Business School told, in the conclusion of "Notes on a Trip to Japan,"[2] that the above claim was based upon the misunderstanding. The discussion of the team also supports the conclusions of Abernathy and Clark. However, the reason for the support is different from theirs.

The research team would like to pick up the following three aspects as important from the findings on discussing the comparability: (1) the emergence of the system of cooperative work as a corporate culture; (2) the development of education and training based upon "Studying Group," and; (3) the development of union-management relations within a company.

[2] Abernathy William J. and Kim B. Clark, *Notes on a Trip to Japan: Concepts and Interpretations*, HBS 82-52.

A. The Emergence of the System of Cooperative Work as a Corporate Culture

(1) Cooperation as a corporate culture

When looking at the recent trails and practices of personnel management of American successful companies appearing in *Men and Women of the Corporation* and *The Change Masters*[3] by R. M. Kanter or in the best-seller, *In Search of Excellence*[4] by T. J. Peters and R. H. Watermann, Jr., many similarities are found in the system of human resource management and shop management of Toyota on which the research was conducted.

The above two books tell that, facing the global recession and the lowering of international competitiveness since the Oil Crisis, some companies in the United States tried the revitalization of inflexible organization, the increase of employees' morale, the delegation of decision power to the lower level of the organization, and the establishment of employees participation in management. Those companies that give favorable treatment of key employees and long-term employment, make up a corporate culture, and try to motivate employees through a system of team work could achieve good results. In the period of uncertainty, people want to be motivated. By establishing trust relationships between management and employees sharing the same values, and giving employees autonomy and entrepreneurship in every unit of organization, the organization can be revitalized. The cases in the above three books show this facts.

It is thought that the will to work held by each employee ultimately leads to the increases in productivity.

(2) Flexible group of cooperation

In the same line as the above, Toyota tries to establish and maintain flexible cooperation by maintaining the autonomy of a work team, which is the smallest unit of management. It must be emphasized that the culture which a Japanese in the northern part of Japan has, and the culture which a Japanese in the southern part has are not the same. The same thing can be said on the western part and the eastern part.

Consequently, it is important to create the social similarities and develop the homogenious attitude within a group. The most important element is the attitude and behavior of the person who leads the group. Toyota takes full consideration of this point in the area of personnel management. Namely, the management thinks much of the personality of the leaders as well as technical knowledge and skill. The personality here means the attitude and behavior which can afford to receive trust from the followers, and can have authority enough to represent the group. At the same time, Toyota tries to establish the system of security of living which is gradually improved in order to maintain the will to work of the members, and it also tries to stabilize the work groups in the long run. These efforts in Toyota have been in the same direction as American successful companies, not in the different one.

(3) Cooperation between strata

The research shows that there exists a close cooperative relations between blue collar

[3] Kanter, R. M., *Men and Women of the Corporation*, Basic Books, 1977; do, *The Change Masters*, Simon & Schuster, 1983.

[4] Peters, Thomas J. and Robert H. Waterman, Jr., *In Search of Excellence: Lessons from America's Best-Run Companies*, Warner Books, 1982.

workers and white collar employees. It must be noted that the role of Engineering Service Staff and the cooperation found in a team for tryout of a new model help to smoothe productive activities and education and training. Is this fact dicisively different from Western work organization? It is noted that, in Volkswagen, the personnel department recently makes a white collar employees stay in a plant. It can be said that difference between blue collar workers and white collar employees and the social distance between them are diminishing, as the educational backgrounds of employees comes to be higher, and as the application of electronics technology advances. Therefore, it is anticipated that, in Western management system, the cooperative relationship between them will be proceeding, and the observation of the team is never the exception.

(4) System of shop management

The emphasis upon a cooperative system is not enough for a company to achieve the efficiency. The system of shop management must be the starting point and the base. The ideas of rational management of organizations by M. Weber or F. Taylor aim at the maximization of efficiency. The same is the case with Japanese organizations. The organizations, whether in Japan or in other country, have to adust the system of direction and coordination, and to establish the system of authority in order to maximize the organizational efficiency. The above-said working paper by Abernathy and Clark points out that Toyota production system is following the idea found in Ford system, and their statement holds in the true sense of achieving the efficiency.

How to implement the policy is the matter of choice of the management. The success stories in *In Search of Excellence* shows that the device and development of managerial methods and tools is needed to delegate managerial authorities of the lower level of organization and to orient the employees to the managerial goals. In Toyota, the system of decision-making by directors is based upon the cooperation among them and is organized in the cob-web fashion. The top management, based upon the above system, decides the managerial goals for a certain period. These managerial goals are specified into the departmental goals, and finally into the goals of a work team. But they are never specified into the level of individual workers. The smallest unit into which the managerial goals are specified is a team at shop floor, a section in office. Every employee is expected to make efforts to achieve the group goals. The management method called as management by objectives, which has been developed in the United States, aims at the increase of morale of individual workers. On the other hand, it has been modified in Japan in the sense that the group goals, not the goals of individual workers, are emphasized. As a result, an assistant foreman, leader of a work team, has to increase productivity and to achieve better results.

This system of shop management, in principle, is similar to the system in Western companies where first-line supervisors take charge of shop management. The difference is that, for example, in West Germany a foreman, Meister, must take the final responsibility, while in Japan members of a team including an assistant foreman must share the responsibility. But the mere existence of this difference cannot lead to the conclusion that Japanese management is different in its form and nature. For example, many trials were made to establish autonomous work groups at Norsk Hydro, Norsk Medisinaldepot and Hunsfos in Phase B of Norwegian cooperation project, employees participation at the shop floor.[5]

[5] Emery, F. E. and E. Thorsrud, *From and Content in Industrial Democracy*, Tavistock, 1969.

The research team recognizes that the above trials are in the same line as Toyota's shop management.

B. The Development of Education and Training Based upon a "Studying Group"

(1) Attitude of employees toward new technology

It is observed that, in Toyota, the policy of multifunctionalization of workers based upon job rotation and on-the-job training enables the company to flexibly allocate workers, and to meet the technological changes. It is also observed that small group activities stimulate the employees willingness to learn, and motivate the employees to learn new technologies and to improve the work methods. It must be pointed out here that the attitudinal climate and the system are emerging where employees always make efforts to learn new technical knowledge and skill. It is necessary to note that Japanese wage system is based upon the general abilities of knowledge and skill which an employee has accumulated, not directly linked with the job he performs. Consequently, the long-term, incessant efforts of an employee come to be evaluated positively by management, and these efforts lead to the continuous learning of new technology. Every employee is expected to increase one's quality of technical skill and knowledge through multi-functionalization.

Tahara plant in Toyota is the newest one, while Tsutsumi plant is the second newest. But there is no difference between the two plants in terms of the nature of a "Studying Group" and the system of education and training. The principles by which Toyota adapt to any kind of new technology is that the group of work is at the same time the "Studying Group." Therefore, in Toyota the polarization of skill has not taken place as the technology of information develops. On the other hand, multi-process handling develops in simple jobs so as to evade the simple and repetitive work. When numerical control machines or industrial robots are introduced, an operator of a machine becomes a programmer and sometimes even comes to work as a system designer. While the research team has not worked upon this theme deeply, the research made in Japan upon the changes of job systems in the development of micro-electronics has shown the results.[6]

(2) Tne concept of "Studying Group"

The recent article appearing in *Fortune* points out that the method of voluntary shop management in Japanese fashion such as QC circle activities has not achieved a good result in the shop floor of American companies.[7] It is appropriate for us to comment upon this negative evaluation. The reason why QC circle activities in Japanese companies could develop into TQC is that, at the outset, workers, supervisors, engineers and managers formed a study group at the shop floor in order to make possible the introduction of new technologies within a limited period. The experiences of learning in a study group were accumulated, and this accumulation of experiences enabled the work group to transform into

Bolweg, J. F., *Job Design and Industrial Democracy*, Reiden, 1976. Thorsrud, D., *A Strategy for Research and Social Change in Industry: A Report on the Industrial Democeacy Project in Norway*, Social Science Information, 1970.

[6] National Institute of Employment and Vocational Research, *A Research Report on the Impact of Micro-Electronics upon the Quality of Employment*, 1983 (in Japanese).

Ito, Makoto, "The Development of Micro-Electronics and the Change of Work Organization, *"The Monthly Journal of the Japan Institute of Labour*, October 1983, pp. 11–20 (in Japanese).

[7] Jeremy Main, *The Trouble with Managing Japanese-Style*, Fortune, April 2, 1984, pp. 10–14.

a "Studying Group" and it helped to create the attitudinal climate favorable for life-long education of workers. Finally, the above facts *in toto* led to the formation of the present form of QC circle activities. Because of this, it is important to develop the group of work into a "Studying Group" by creating the attitudinal climate for learning in case of the shop floor where workers have no experiences of holding a study group with each other. The evaluation of QC circle activities must based upon this argument.

The policies of multi-functionalization and autonomous work groups in Toyota, as has been pointed out, share the same ideas and principles as was found in Norweigian experiments in autonomous work groups and in West German projects for humanization of work. Namely, job enlargement and flexible form of work have the same principles in common. Let's take the examples of education and training. Toyota has wide range of education and training ranging from handicraft training to electronics education. This system is comparable with primary training and apprenticeship, and more advanced training in West Germany. It can be said that German education and training system, which meets the necessity of new technologies, is not so different from that in Toyota. In West Germany, the increase in the level of skill resulting from education and training corresponds to the increase in wage categories. This is thought to be similar to the correlative relationship of skill accumulated in the long run with the wage rates of the workers.[8]

(3) The development of education and training within a company

In 1950s when many technologies were introduced to Japan, each company developed and devised the system of education and training of its own, based upon a study group at the shop floor, since public vocational education and training system was not well established. Namely, a group of production came to be a group of study.

It is commonly recognized that members of the shop floor learn new technological knowledge and skill in a short period and they come to perform the tasks in Japan. Labor unions share this views with management. As a result, unions make efforts to create the situations where members can easily learn, and management invests a large amount of money in education and training.

C. The development of union-management relations within a company

(1) Post-war economic crisis and labor relations

The research team focusses its attention upon the post-war development of union-management relations, while union-management relations in Toyota is based upon the relations between undertaking-based union and management. In Japanese automobile industry, an industrial union, All-Japan Automobile Industry Workers' union (AJAIW), was formed in 1948. Workers in Toyota were organized into an undertaking local union of the industrial union. The policies of Occupation Forces for the first time turned the positive attitude toward economic reconstruction of Japan in 1949, and the most emphasized policy was monetary policies aiming at hindrance of inflations. Because of this policy, the financial conditions of Toyota were devastated. At the same time, AJAIW started the severe labor movement. In the end of 1949, Toyota almost went bankrupt, all the

[8] Forschungsinstitut der Friedrich-Ebert-Stiftung, Hg, *Qualifikation und Beteiligung—Das Eeiner Modell*, HdA 12, Campus 1981.
Volkswagen, Hg, *Gruppenarbeit in der Notorenmontage*, HdA 3, Campus 1980.

directors of the company including a president who initiated the company resigned, and the bank who helped to evade financial difficulties sent directors to Toyota. The labor movement guided by AJAIW went to the peak in 1950.

Toyota asked its employees for understanding and cooperation in order to reconstruct the company, and the rank-and-file workers decided to secede from an industrial union so as to acquire the securities of living and employment. As a result, the workers organized an independent, undertaking-based union, and the reconstruction of the company in cooperation with a labor union began.

(2) Undertaking-based union

Much the same things happened during the period in many of the Japanese companies. The Occupation ended, and Japanese economy came to be reconstructed in a full scale. Union-management relations in each company developed according to the situations where it operates, the level of technology, the international competition in a product market, and so on. Gradually, undertaking-based unionism came to be a major form of union organizations in Japan. It is well recognized that this form of unionism cannot be defined as a "company-dominated" union. Labour Union Act of Japan recognized the right to organize, the right to bargain, and the right to strike to every type of union in a private sector. This holds the case with a union in Toyota.

Firstly, while a union sees members' willingness to work in the affirmative, it secures employments, and improvements of wages and living conditions through web of rules based upon written agreements and codetermination. This report already described that the participation of members in union shop meetings was very high.

Secondly, Toyota Motor Workers' Union affiliates with a national industrial union, Confederation of Japan Automobile Workers' Union (CJAWU), exchanging ideas and information, cooperating with other undertaking-based unions. The CJAWU is different from the abovesaid AJAIW in the sense that the former is a loosely federating body (confederation) and it recognizes the wide range of autonomies of its affiliates. The CJAWU sets the standards of wages, hours and other terms and conditions of employment, and its affiliates demand of, consult with the management on the basis of the standards. Toyota Motor Workers' Union, affiliate of CJAWU, takes the leading role in wage increases during "Spring Wage Offensive."

The nature of labor relations in Japan is a product of the post-war history of Japan, and in that sense it can be said that the nature of labor relations reflects the Japanese society. In short, the labor relations in Japan concentrates upon the undertaking-based union which can have more autonomy than a local or branch in Western countries has, and the labor relations is based upon company-wide relations, not upon the national relations.

However, the above characteristics are not limited to the Japanese scene. For example, the function of consultation and codetermination tend to be widening between the management and a works council in West Germany as the codetermination act and the works constitution act have developed. In line with this development and tendency, the cooperative relations between a works council and a labor union tend to be strengthened. Also in Sweden, Act on Codetermination at Work has made the role of unions within an undertaking more important, and in many European countries labor relations within a undertaking have come to focus upon as board representation of workers has been introduced. It must be pointed out that the Japanese labor relations system based upon

union-management relations within an undertaking has come fairly comparable with recent union-management relations in other countries.

HITOTSUBASHI UNIVERSITY

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