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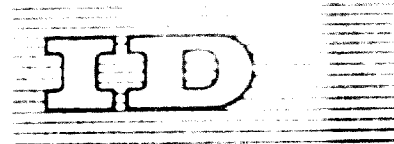
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D00756



Dist.
LIMITED
ID.69-5490
22 October 1969

United Nations Industrial Development Organization

ORIGINAL: ENGLISH

Regional Workshop on the
Use of Consultants

Tokyo, Japan, 1-13 December 1969

CONDITIONS OF A SUCCESSFUL CONSULTING ASSIGNMENT ^{1/}

(Employer - Consultants Relationships)

by

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We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.

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I. Case assumptions

The managers of the "TELEK" Corporation were faced with a new and difficult task in 1967. The objectives of this task were formulated as follows:

DESIGN the MANAGEMENT SYSTEM for a NEW PLANT which will start to manufacture NEW ELECTRONIC DEVICES in July 1969 (semiconductors and some input-output devices).

The managers had the opportunity to design a completely new management system almost free of any kind of limitations. In fact, they had the opportunity to design and apply the most advanced concepts in the field of management including computer assisted planning and control system.

The goals of the new plant as well as the characteristics were defined in the following way:

- a) to reach in three years the sales volume equal to \$12 million per year;
- b) to exploit the area of 100,000 square feet;
- c) to employ about 550 employees

The design process was free of limitations except two problems. It was, however, necessary to concentrate the production of semiconductors which were manufactured before 1969 by several existing enterprises of the corporation in the new plant. The value of that production was equal to 2 million US dollars each year.

Another advantage but at the same time a disadvantage of the designing process, was connected with the existing computer network which could be used to process data for the new plant and its decision-making system. It limited, in fact, through the hardware (computer capacity) and the software (programmes and algorithms) the work of the system designers.

It was decided, after many discussions, that the task could be resolved by the managers supported in some fields by a group of consultants.

The analysis had shown that supporting of consultants was required in the following areas:

- production flows (design of manufacturing process),
- production scheduling,
- information system,
- organization structure.

The whole job was divided into two parts and performed in two periods:

- a) the first one from 1967 to June 1969 during which the preparation of all projects was planned, and
- b) the second period, starting in July 1969, devoted to implementing of all designed and accepted solutions.

The corporation had chosen a specialized consulting firm as an adviser in fields mentioned above. It was decided that the consultants would arrive and begin their job on a basis of a programme which should be accepted by both contracting partners. The list of specialists and the duration of all particular tasks as well as the position of consultants should be broken down in a special agreement.

The appointment of the managers of the new plant (the general manager and two vice-presidents), occurred in the right time. They all supervised the constructing of the plant and started some activities connected with the design process of the factory. They established a temporary structure of the plant. It consisted of three manufacturing divisions and six staff departments: planning, manufacturing, marketing, engineering, employment, and maintenance. The chiefs of three of them were appointed. They occupied the head posts of the following departments: engineering, manufacturing and planning. Some experienced workers were sent by other plants and by the Corporation to secure the proper preparation of the new plant and to participate in the designing process.

The agreement between the plant management and the consulting firm was signed in December 1966. It was based on the contract which created the framework for all future agreements and more detailed plans as well as mutual responsibilities.

The agreement consisted of the following problems and duties:

1. OBJECTIVES AND JOB DESCRIPTION.
2. RESPONSIBILITIES OF THE EMPLOYER.
3. PREPARATION BEFORE CONSULTANTS' ARRIVAL.
4. POSITION OF CONSULTANTS AND SPECIAL SERVICES.

I am trying to discuss all the other problems in the second chapter of this paper. Each of these problems is presented in that way that one or two of the problems mentioned above are used to show the procedure. The presentation of each problem is divided into two sections. The first section shows the procedure which was applied to solve a problem in the CASE. The second one is devoted to the presentation of general conclusions for an effective consultants' job, formulated on a basis of the CASE discussion.

II. Employer-consultant relationships

Ad 1. Objectives and job description

CASE

A. PRODUCTION FLOWS

Objective: DESIGN FLOWS OF MATERIALS AND LABOUR in each division and among them under a condition that each shop order will be accomplished NOT LATER THAN in the required time (order date).

Measurement system (control process):

- a) number of days of delay of the shop order accomplishment;
- b) total cost of delay in each period;
- c) the difference between the optimum volume of production calculated on a basis of the machine capacities and the real production;
- d) machines loading balance.

The measurement of effects was planned in the following way:

loss coefficient $\frac{C_{do}}{S_0}$ ≤ 1 , where C_{do} is the cost (or the loss of revenue) of delayed orders and S_0 is the total sale of those orders.

loading coefficient $\frac{\sum t_r}{\sum t_t} \leq 1$, where t_r is the number of hours in a given period for all machines and t_t is the number of productive hours (without down time, idle time).

capacity coefficient $\frac{P_n}{P_0} \leq 1$, where P_n means the value of production in period "n" and P_0 is the optimum value of production in the same period.

The most important tasks which determine the accomplishment of objectives and affect the job of consultants are listed below.

1. Calculate the capacity of all kinds of machines;
2. Calculate the number of machines of each type;
3. Design production lines (job layout, group layout, and the functional layout as well as the sequence of operations);
4. Define the kind and code of groups of items (finished products) and items within each group;
5. List operations (types, code, and kinds of machines suitable for those operations);
6. Define kinds and code of all components of each item (parts, assemblies, subassemblies).

B. PRODUCTION SCHEDULING

The manufacturing process was defined as a job lot system. About 60 % of all finished goods were designed as a manufacturing process finished by the assembly division. It was, therefore, decided that the process should be organized on a basis of shop orders.

Objective: MAXIMIZE THE PRODUCTION VOLUME in each period under following conditions:

- a) each order should be accomplished in the required date;
- b) the idle time of machines should be minimized.

Measurement system.

The objective means that "c" (capacity coefficient) should be maximized. The first condition means, however, that the coefficient "d" should be minimized.

The second condition can be formulated as follows:

i (minimum) = $\frac{I_t}{I_{t_0}}$, where I_t is the idle time of all machines in period t and I_{t_0} means the shortest idle time in the last twelve periods.

The most important tasks and jobs ensuring the reaching of the given objective are listed below.

1. Design the content of the schedule;
2. Design the frequency of the scheduling and the principles of the procedure of scheduling;
3. Design the basic assumptions and the routine of the shop order system.

4. Define the basic assumptions and the most adequate formula for the opening of orders (like FIFO concept, LIFO formula);
5. Apply the Pareto curve to calculate the value of unfinished production;
6. Design the system of measurement of deviations from the expected and desired value and quality of production;
7. Design the procedure of the replenishing process.

Similar procedure was applied in the two remaining areas of the consultants' job. By the way, the information system (generation of data, storage, transmission and retrieval of data) was the most sophisticated problem of all tasks which were mentioned before.

GENERAL CONCLUSIONS

The formulation of objectives and tasks is the most important factor of a successful job of consultants.

We can conclude on the basis of our examples that there are some general procedures connected with a consulting job. One of these procedures can be formulated in the following way:

- A. Formulate the objectives in each field of management covered by the consultants job;
- B. The next condition of a well-defined task is the formulation of a measurement system. It is necessary to define, if possible, quantitative measures showing the degree of accomplishment of objectives (goals);
- C. Each objective should be divided into many well-defined tasks (subobjectives) which have to show the more detailed job;
- D. The evaluation of expected results.

In fact, the consultants are used in a case in which tasks require specialized knowledge and applying of modern relations. It is, therefore, very important to know exactly which problems require a new approach and what are the reasons of unsatisfactory previous results of a working company.

Ad 2. The responsibilities of employer

CASE

The mutual responsibilities were formulated in the contract. After the areas of the use of consultants became clear and the objectives were formulated it was necessary to create conditions under which the job

could be performed successfully. Thus, the responsibilities of the employer were listed. The first part of the list involved the responsibilities of the company before the arrival of consultants. The second part involved, in contrary, activities and employers duties during the stay of consultants.

I intend to discuss in this section the second group of responsibilities.

After the arrival of the first group of consultants the management presented the objectives and a list of job descriptions of consultants' tasks. During some meetings the objectives and tasks were discussed and changed. The improved list of both objectives and jobs were accepted by the vice-president of the plant and the chief of the group of consultants.

The leadership organized a meeting between consultants and their counterparts. The leader of the group of counterparts was appointed. After two weeks, when the people started to know each other, consultants and their counterparts attended a meeting with division and department heads. That created, in fact, the basis for mutual understanding.

Co-ordination of all activities and supervising of the performance are the further duties and activities of the employer. The next move after the leadership was, therefore, the appointment of one of the vice-presidents of the company as a man who was responsible for the end result. The project of the job was prepared by the consultants and their counterparts. It was later accepted by the general manager of the plant.

A mixed group of consultants and plant workers was used as a task group with all consequences of that kind of flexible solution of important and difficult problems. A network diagram was prepared by the group and accepted by the leading vice-president as an implementation schedule of the project. Each activity of the network (each arrow) had its performer who was responsible for the proper performance on the required date.

Once a week the development of the project was analyzed and new decisions were taken.

GENERAL CONCLUSIONS

The responsibilities of the employer can be listed in the following order:

- A. Formulation of objectives;
- B. Formulation of tasks and full description of consultant's job;
- C. Formulation of limitations which will affect the freedom of solutions suggested by consultants;
- D. Creation of start conditions of an effective job of consultants;
- E. Appointment of experienced counterparts of the consultants;
- F. Supporting of the authority of consultants;
- G. Co-ordinating of all activities of the project;
- H. Supervising the performance and replanning routine of the critical activities;
- I. Organizing of periodical meetings of plant workers and consultants to explain objectives, tasks, and to discuss recent performance and results;
- J. Training and instructing of workers to assure the proper implementation of solutions prepared and suggested by consultants.

One of the most important problems was not mentioned above. It is the problem of a free access of consultants to all information they need in their job. Gathering of information and the possibility of frank discussions are factors of a great importance. Only an atmosphere of mutual confidence can create proper relations between both groups. Good final results of a consulting job cannot be expected if some information channels are not open to the consultants.

Ad 3. Preparation before arrival of consultants

CASE

Some preparation duties and needs will be shown using the information system design as an example.

The objective of an information system which should be incorporated in the decision-making process can be defined as a tool used to improve decisions. The benefit of an applied information system can be measured through comparing previous returns (or profit) reached under old conditions and actual effects reached in a period when the improved information and decision-making system started to work.

The employer listed all problems of some importance which could affect designing and implementing of the new information system.

The list of these problems involves following activities:

- A. Listing of all kinds of machines which will be installed in the new plant including the characteristic of the technical parameters of these machines and devices;
- B. Listing of groups of products including the presentation of the technological structure of those products (important for the information system design as well as for the production flows and scheduling);
- C. Description of the manufacturing process,
- D. Gathering and replenishment of all documents and data elements connected with the construction of future products and the technological process (material bills, detail drawings and standards);
- E. Evaluating of the increasing value of expenditures (raw materials and labour) along the manufacturing process based on the Pareto curve calculation;
- F. Gathering of all programmes used by the computer centre for the data processing system, working in other companies of the "TELEX" Corporation;
- G. Presenting of the computer network limitations (the available capacity of the system, languages and code, number of hours available to the plant);
- H. Listing of report requirements and their contents, frequency and the need for kinds of decisions generated in on-line, realtime system,
- I. Listing of order in which the modules (decision areas) should be designed in the information system and incorporated in the management information system.

It was clear that the preparation of all information necessary for the effective designing of the management information system required highly organized work. Moreover, the managers and staff and line workers were forced to start the gathering of information listed above several months before the arrival of consultants.

The importance of preparation of all information is so great that it cannot be overrated.

GENERAL CONCLUSIONS

The top problem of a successful job of consultants is the defining of objectives. This problem was discussed widely in the first two sections. The problem of a proper choice of areas in which the consultants can be used with the best results was also stressed in this paper.

Other important elements of the preparation, made before the arrival of consultants, can be presented in a few points.

- A. Gathering of information connected with problems which will be the subject of consultants' job making the consultants familiar with all questions as soon as possible just after their arrival;
- B. Selecting of counterparts;
- C. Developing of concept of all requirements and desired solutions (expected results, report requirements, planning and control system, and so on);
- D. Defining of the position of consultants within the structure of the organization;
- E. Assuring of special services making the work of consultants as easy as possible.

Problems mentioned above under A, B, and C will be discussed a little wider in the last section of this paper.

The preparation is really a piece of hard work. It must be, however, done if the employer wants to improve the performance of the company in a short time and at relatively low cost (expenses).

The longer and better is the preparation the shorter and more profitable is the consultant's work.

Ad 4. Position of consultants and special services

CASE

It was decided that according to four areas, four consultants were appointed as task leaders. They were responsible for their own work and for the jobs of all other people working in particular areas. The function of supervising and co-ordination of the whole project was performed by the chief of consultants called the project leader.

Five plant workers were appointed as counterparts of consultants to assist them in organizing of groups and performing of tasks.

The position of all leaders in the structure of the company was widely discussed. The leadership came after considerations to the conclusion that the chief of consultants should be incorporated in the formal structure. The project leader was, therefore, appointed as an adviser of the vice-president of the company. The four other leaders became task force leaders.

A task force system requires, by the way, respecting of the following assumptions:

- task force is a group of people organized as a unit which can act partly independently of the existing structure and is, therefore, a flexible temporary solution,
- the responsibilities and rights of a task force leader must be formulated precisely for all activities of a project,
- a task force group can exist only until a certain date and must be released from the task after this date.

The project and task leaders started to work. Moreover, they started to make decisions. As a result of this position, solving the relations between division heads and consultants became slowly worse and worse. Both management and the chief of consultants came, therefore, to the conclusion that the problem was resolved badly and changed it. The task leaders became advisers. This move improved rapidly the situation and accelerated the progress of the design process.

A task force concept is, in fact, a good solution in a case in which there is one task and a single leader in an enterprise only. It is not the best solution when there are many tasks and as a consequence many task group leaders. The knowledge, experience, and the performance of consultants are the sources of their authority and position. The position of consultants in the hierarchy of a structure is, I think, rather a second range problem.

Very important are the conditions under which the consultants have to work. Realizing that, the management equipped three office rooms with necessary materials and devices, such as designing boards, printing devices, drafting materials made the work much easier. Medical care and other social services were available to all consultants.

GENERAL CONCLUSIONS

- A. It is of great importance to create conditions for mutual understanding which is possible when the consultants are situated in a structure as advisers and assistants only;
- B. The improvement of results of a company (or another kind of organization) is possible and can be reached when the managers, supervisors, and other workers of the company will accept the suggestions and proposals as their own ideas instead of being forced to apply all these solutions;
- C. It is, however, meaningful to create a group of consultants, to situate this group as a unit in the formal structure, to locate this unit on a high level of the structure, and supervising step by step the performance of a person being the holder of the leadership (top management);
- D. It is important for a good disposition and feeling of consultants to assure the access to several kinds of social services that pushes consultants closer to the employees and helps them to know and understand living and working conditions of the employees.

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