Division of Research
Graduate School of Business Administration
The University of Michigan

March 1976

PRODUCTION: ITS PLACE IN COMPANY STRUCTURE AND MANAGEMENT

Working Paper No. 127

by

Anatoly Porokhovsky

Moscow State University

Guest of The University of Michigan

FOR DISCUSSION PURPOSES ONLY

In looking at the literature dealing with issues of management, control, structure, strategy, and so forth in industrial companies, one sees that it is generally divided into two unequal parts. The first and major part covers common problems of management of the organization as a whole. The second part is concerned purely with production management. This division of the literature presents a definite break between studying production management as such and studying production management as a part of management as a whole.[1] As a result, the most important part of any study, namely a systematic investigation of the subject, is prevented in the case of managements.

This split in the economic, management, and technical literature has historical roots.

A Historical View

Everyone who is familiar with the history of industrial development in the United States knows that to the end of the nineteenth century, and even the beginning of the twentieth century, the United States possessed a large market characterized by a great demand for industrial goods. Under these circumstances, the concerns of businessmen were concentrated on production--i.e., on the resolution of manufacturing problems--precisely because the success of their businesses depended on how new and how inexpensive their products were. As a rule, in this period almost every industrial firm consisted of a single plant in which the owner himself performed a number of functions. He was directly involved in running production, hiring workers, purchasing raw materials, selling his products, etc. But his main attention was focused on production--the basis of his business.

If one looks at the organization of business of this period from a social viewpoint, it is not difficult to observe a division of labor into two types. The first, and main type, was transacted between businessmen themselves, with each businessman being a representative of his own business. This type of labor might be called its social division. The second type occurred inside each business or firm according to its technology and equipment and can be called the internal or technical division of labor.

The ties between businessmen in the economy were based on the market and competition. And the ties between employees within the firm were strongly determined by the businessman as the owner of the enterprise. The size of each enterprise, its volume of production and its number of employees, was such that the owner could run his business by himself with the help of a few assistants. Under these conditions the success of a businessman's firm depended upon its production processes being well organized and its use of labor in each position being effective, thus reducing its production costs and raising the competitiveness of its product. In short, success would depend on improving production management. It is not surprising, therefore, that the first serious works on management were concerned primarily with the organization of work and after that with the organization of production as a whole. In this connection the works of Frederick Taylor became well known in the United States and abroad. The science of production management began to develop rapidly, and this development has significance even today.

At approximately the beginning of the twentieth century, however, the concentration of production and capital accelerated and significantly increased the size of an individual firm and the complexity of the ties both between and within business firms. On one hand, within the company the division of labor between its various parts--production, purchasing, sales, research and development, marketing, etc.--continued to develop. The company as a particular type of business had now come to involve not only a division of labor within factories, the technical division of labor, but also a division of labor between different spheres of business activity. This development led to the following: First, the company itself had to fulfill in part functions which formerly had been entirely fulfiled by the market and competition. And, secondly, the management of the company came to exceed the bounds of its earlier concern solely with production management and began to involve the management of a wide variety of company activities. Thus, there was a substantial change in the process of the development of production and business, which led, in turn, to the further development of business structure and management.

At the same time, in conjunction with the huge increase of the volume of production, the increase in the number of goods produced faced businessmen with the problem of selling their products--that is, with the task of studying their market and all the problems connected with this. As a result marketing has become the major problem of concern for most companies. Indeed, in response to the question of what is the main activity of their company, managers answer marketing. Of course, there are some examples of companies in which marketing is not the paramount problem, but nevertheless, modern economic conditions force the majority of companies to pay the greatest attention to marketing.

Thus, in both the practice and the science of management, production management evolved into the concern of plant managers and professors who write books on production management. Here we are concerned, not with the technical side of production, but with the economic and managerial side of business. From the economic and managerial point of view one needs to examine production first as to its role in the business as a whole, and second as to its place in the structure of business. Obviously, the view of production in these senses will not be weighted equally.

Production and Business

As indicated above, early in the development of American capitalism the meaning of the terms "production" and "business" in industry essentially coincided. However, as American capitalism developed, the term "business" in the industrial area came to involve, in addition to production as such, research and development, planning, finance, marketing, and so forth. When we now speak of big business, therefore, as a rule we have in mind the entire complex of activities which must be performed in order for a company to function.

To understand the basis of business and what that basis requires to promote the life of a business, it is necessary to view a business as an organic whole, such as a tree. Every tree has roots, from which grow a trunk, branches, and leaves. Without roots a tree is dead, but it is the leaves and branches of a tree which promote its life. They use the warmth from the sun and the elements from the air to sustain the roots. If the roots fail to produce shoots above ground, they die. The roots are needed, however, not for their own sake, but for that of the tree. In the particular configuration of a tree we can look at the roots as the material base of the tree structure. The growth of a tree involves the growth of its roots, its material base, as well. If something happens to remove the leaves and branches of a tree, the root is itself still capable of giving life to new shoots and a new tree as a new structure. But if the roots die, the whole tree and its entire complex is lost and nothing can revive it. Of course, one can plant a new tree, and one must also recognize that some kinds of tree can grow roots from branches and cuttings which themselves give new life (but this only shows the strong influence which the branches of a tree can have on both its roots and its life as a whole).

If we view the whole complex of any big business as if on a tree, it is not difficult to observe that production is the root of a business, and little else. In reality it is because of production that there occur all other business activities, which on one hand sustain production and on the other hand constitute the business as such. If difficulties occur in the production process this is reflected on the business as a whole. If something happens to the other aspects of business activity but production remains normal, the company, as a rule, is in an easier position to find a solution and correct the situation than it would be if there were a necessity to rebuild production. In such a case it is only necessary to make changes in marketing, or research and development, or in control systems and the like. Marketing, control systems, finance, planning, and so on have an influence on production, changing its character or its output as the leaves and branches of a tree have feedback to its roots. However, without production, there can be none of these activities in industrial firms.

Clearly, then, the material basis of any industrial business is production. Capital is necessary in order to begin production. Where and how to get it is another issue. The question we are concerned with here is the place (role) of production in business.

The issues concerning the material basis of business are not, however, the same issues as those involved in the place of production in business structure. With the same material basis the same kind of businesses can have differing organizational structures as is substantiated by actual practice in the modern economies of the United States and other capitalist countries.

Production and the Structure of Business

A lot of works have been devoted to analyzing the structure of business.[2] Their authors examine various factors which cause a change in the structure of companies and the principals of forming structures as such. One can cite companies that have horizontal structures, vertical structures, or functional structures (including in this later category the geographical distribution of factories and offices) and other companies whose structure is a mixture of these.

At first glance it seems that companies adapt their structures to the requirements of demand and the market and that in doing so their strategy has a decisive influence on company structure. One can agree entirely with this statement if one ignores the fact that most companies of one and the same branch of industry have a similar structure. Let us take, for example, automobile companies or, for another example, diversified companies which encompass related branches of an industry. In both cases we can find common features of the structures amongst the firms of each of the industries themselves.

If this is so, and one branch of industry is distinguished from another first by the character of its production, then it is not difficult to observe a direct tie between the character of production and the type of the company's structure. This leads us to conclude that the leading factor in developing company structure is production. Of course, it does not follow at all from this conclusion that there are other factors which cause change in a company's structure. Moreover, if one examines any concrete period of a company's development, then it maybe possible to observe that first of all, it is not production but the market which forces the company to reorganize. This observation concerns only one period of development, however. In general the structures of companies are based on the character of production activity.

Here we can make a comparison with a building. Every building has a foundation. But even buildings on the very same type of foundation may be quite different inside and out. While the foundation determines the building's general configuration and dimensions, it does not determine all the building's specific details. These can be designed to meet the particular desires of the owner and to fit various purposes. In a similar manner, the structure of a company can be influenced by various factors, including the nature of the character and skills of company managers. But whatever structure of business we examine, we always observe that the lowest level of structure belongs to production.

This is why in determining the role of production in business structure it is necessary not to be limited to a quick look at the recent situation but to follow carefully the connections between the development of production and the structure of companies during a long period. As in any organization there is a feedback in business from structure to production, from strategy to production and so on. In a number of cases the feedback can be stronger than direct influences. But these influences do not nullify the leading reason for changing the structure of an industrial company.

Production Management and Business

The problem of production management can be examined from two angles. First, as the problem of production management per se, and second as a component part of the company or business. As we have already noted, the practice and theory of management has its origins in production management as such. But in modern economic organization, such as that of any big business, production management is a more important component of business than is production management as such. In the activities of companies as a whole the result of production activities, and not the organization of production processes, has a most important significance, because production creates goods which a company can sell or can use for internal purposes. From this point of view, the goal of production management consists of achieving those results which the company needs to maintain a satisfactory position vis-á-vis its competitors.

To the extent that a company's position in the market and its strategy are changing, then its production goals will change, too, but without exception all companies as entire entities encounter changing situations in their markets and national economies. These changes are transmitted by their headquarters or staff to all parts of the company, including production. The very fact of frequent changes in production management does not mean that it is impossible to find common indicators which usually are used for determining production goals as well as for evaluating production results. It is necessary to emphasize that it is difficult to find even two identical companies where production management would be completely similar. Although each company tries to resolve this area according to its own approach, it is possible to find common features in the numerous ways and methods, indicators, and criteria used by companies in production management--just as it is possible to find common features among normal people, although it is difficult to find identical people.

Various production activities differ from each other first of all by the product mixture. Each company strives to have the very best and most competitive output. Therefore, a company has to manufacture precisely that production mixture which has the greatest demand or most customers. In these conditions it is not profitable for a company either to expand or reduce its product mixture, because in either case the company will lose profits. If this is correct then a company establishes its own specific production mixture.

It is well known that a market cannot absorb any amount of production. The size of a market depends on many factors which companies study. A company wants to forecast the size of the market or to receive specific orders for output. It follows that the output of any company must be produced in an amount for which either there are orders or for which, according to marketing forecasts, there is the possibility of sales. If production exceeds this level, inventories may grow and profits may be reduced. Therefore, for the company as a whole it is important to plan for production both the product mixture and the volume of output.

Each company exists not for production itself, but to earn revenue and make profit. Other conditions being the same, the lower the cost of production, the higher will be the profit. Therefore its production costs are very important for a company. Insofar as production represents a big portion of company cost, minimizing the cost of production can be viewed as both a goal and a result of production by which all production activity can be evaluated. Thus, to the two indicators mentioned above, product mixture and output, which can be planned for a company's factory, can be added another--the cost of production.

It is not infrequent in business that factories and plants in trying to reduce the cost of production neglect quality. Reduction of quality is promptly reflected in a company's competitiveness, however, which leads to a loss of income and customer trust. This interrelation forces management to pay attention to quality and when trying to reduce production costs, to maintain quality at the same time. Production with good quality and an appropriate price always has customers.

Under contemporary economic conditions improvement of goods in the market proceeds quickly. Companies have to work on creating new goods and there is the continuous introduction of new products in their manufacturing. In order to adapt to demand, production is continually adjusted to include new products whose share in output continually increases. Although for any plant it is easier to manufacture the old products and difficult to start production for new products, a company must be prepared to produce to meet demand for new items. Consequently, company managers set up quotas for new products to be produced in plant output. Only in this way does a company maintain its place in the market and its competitive position.

If a factory replaces its equipment with new equipment all at once, it will suffer a production stoppage, a break in capital turnover, and finally company losses. To avoid these negative consequences and yet always to have modern equipment, the factory must introduce new equipment continually. In this manner a company preserves its technological position, an important consideration because as a rule new machinery guarantees a higher labor productivity and lowers costs of production. To accomplish orderly technological updating a company establishes for its factories the amount of new equipment to be installed and the timing of its installation.

One frequently finds in industry completely similar factories with the same equipment and labor forces which nonetheless have different production costs. One of the main causes of this difference is that the equipment of these plants is used in different ways. And consequently they have different capital turnover. Where capital turnover is less the cost of production will be more. Any company has an interest in using its equipment with the greatest effectiveness and in maintaining the quality of its equipment. Therefore, the company establishes for its plants indicators for equipment usage or revenue on capital.

In summary, from the viewpoint of the company as a whole, it is necessary to evaluate production in terms of such indicators or elements as:

--Product mixture

--Volume of output

--Cost of production

--Quality

--The proportion of new goods in output

--The use of new technology

--Revenue on capital, or equipment usage

Several of these elements (product mixture, volume of output, quality) can be measured in either physical or monetary units. But the remaining indicators can be established only in monetary terms.

Among the indicators the cost of production is "synthetic," because in essence it includes such factors as labor productivity, wages and salaries, depreciation, and other factors which comprise the cost of production. It is not accidental, therefore, that the relation between the actual cost of production and planned cost of production is frequently used as a criterion of production efficiency or of plant efficiency.

In this connection it is interesting to note that at a special conference held in Cleveland, Ohio, in June 1957 on "The Factory of the Future" one report mentioned that:

> The productive force in manufacturing plants of the future will have three major fields of responsibility:
> 1. It will be responsible for quality of production. Quality will be the key to profits for the plant of the future, too.
> 2. It will be responsible for product quality.
> 3. It will be responsible for production cost.[3]

It appears that the prediction of the conference has become reality in recent times. But now the productive force is responsible as well for indicators that directly determine the interconnections between production and the market for both present and future prospects--for example, the indicator for revenue on capital, which directly connects present tasks with the possibilities for future business development. In short, what was the future in 1957 has become the reality of American business today.

Companies' use of the above elements in managing their factories justifies saying that, although plants cannot be considered as the profit or investment centers of companies, they can be considered as cost (or expenditure) centers, since all issues which do not directly concern production but concern purchasing, selling, pricing, investment, and so forth are resolved not by plants, but by headquarters or other units of the company.

Of course, production management in big business does not consist only of working on the matters measured by the above-mentioned elements and letting things take care of themselves. Plant management is a complex, dynamic process. The strategy of the company may emphasize certain aspects of production--for example, quality--which in certain circumstances are more important. Therefore, in general production management is the system of planning, control, motivation--a complex device reacting to all changes in the market and national economy. Companies do not simply determine for plants what, how much, and when to produce, but they motivate plant managers so that the plant works for the common goals of the company.

Professor Wickham Skinner has written:

> The purpose of manufacturing is to serve the company--
> to meet its needs for survival, profit, and growth.

> Manufacturing is part of the strategic concept that relates a company's strengths and resources to opportunities in the market. Each strategy creates a unique manufacturing task. Manufacturing management's ability to meet that task is the key measure of its success.[4]

If a company strives for a strong position in the market and in the economy, then it tries to have its factories fulfill all tasks and perform well in terms of all elements, because underachievement in regard to one element disturbs the system of all elements. If a company decides to maneuver in the market, then often short-term goals are determined for production. But, in any case a change of production management must proceed in a balanced manner. On one hand all other aspects of company activity besides production must be taken into account. On the other hand the planning indicators for production must be accompanied by an appropriate system of control and incentives. Each plant manager has to know in advance what will happen if the plant does not fulfill its tasks or what he will receive if the plant completely fulfills its tasks.

A Brief Conclusion

This article has not examined the numerous issues which are concerned with problems of production, management and business in general. I paid attention to only a few issues, and furthermore I have only sketched the problems involved, not given a detailed analysis. However, I find it is possible to come to several conclusions.

From the historical point of view production was the reason for the development of a division of labor both in individual enterprises and in the economy as a whole. There appeared and there continue to exist three types of division of labor: that in the plant, that in the company, and that in the economy. But management, as practice and theory, began its development from production--that is, from division of labor in the plant.

Because of its specific nature, production is the material basis of any industrial business, and it is the leading determinant of company structure.

In the management of production big business relies on several different elements. The significance of each depends on concrete situations and on the strategy of a given business. But the production management is most effective when the elements for production are considered as an organic whole with the system of control and incentives.

Footnotes

1. Concerning issues of production management see, Franklin G. Moore, Production Management, (6th ed; Homewood, Ill.: Richard D. Irwin, 1973). Wickham Skinner has written whole series of articles with a broad approach to production. See for example his latest articles: "The Focused Factory," Harvard Business Review, May - June 1974, pp. 113-21 and "The Decline, Fall, and Renewal of Manufacturing Plants," Industrial Engineering, Oct. 1974, pp. 32-38.

2. See for example Alfred D. Chandler, Strategy and Structure: Chapters in the History of the American Industrial Enterprise (Cambridge, Mass.: MIT Press, 1962); Larry E. Greiner, "Evolution and Revolution as Organizations Grow," Harvard Business Review, July - Aug. 1972, pp. 37-46; Bruce R. Scott, "The Industrial State: Old Myths and New Realities," Harvard Business Review, Mar. - Apr. 1973, pp. 133-48; Richard P. Rumelt, Strategy, Structure, and Economic Performance (Boston, Mass.: Harvard Business School, 1974).

3. American Management Association, Toward the Factory of the Future (Special Report), New York, 1957, p. 23.

4. Wickham Skinner, "Manufacturing--Missing Link in Corporate Strategy," Harvard Business Review, May - June 1969, p. 140.