Chapter 2
Capacity of Production

I. C. Dima
University Valahia of Targoviste, Romania

Sebastian Kot
Technology University of Częstochowska, Poland

ABSTRACT

It is always necessary to differentiate between an industrial company’s production capacity (it shows the industrial company’s maximum possible production in a time interval of one year), the production achieved by the industrial company, and industrial company’s size (its size in terms of production volume that it may achieve). The production capacity can be analysed under two aspects, dynamic and static. Taking into account the specificity of the production departments within an industrial company, the production capacity must be calculated separately for the basic departments, auxiliary departments, and service departments. Knowing the production capacity and production volume achieved, the capacity reserves shall be determined, which can generally be extensive or intensive. When analysing and optimising the level of the production capacity, the operative management has a special role. The constructive, material, and technological preparation of production that shall be achieved within the industrial companies influences how the production capacity is calculated as well as its size.

DEFINING THE PRODUCTION CAPACITY

If there is a unanimity of opinions regarding the need of knowing and registering all capacities of production, there are certain diverging opinions regarding the definition and interpretation of the capacity of production, with negative implications on the real sizing of the productive potential.

Thusly, the scientific determination of the production capacity is often replaced with some empirical calculations or even a de facto situation. Such an approach fully excludes the opportunity of discovering the internal capacity reserves, which does not allow a better use of the production factors (Slack, Chambers, & Johnston, 2001).

Another interpretation given to the production capacity is to identify it with the production achieved at the level of the bottleneck, an interpretation which already cancels some existing capacities and determines the disuse of directing machines at full capacity.
There is also an opinion based on the static feature of capacity, thusly ignoring the reality that proves the possibility of achieving some different results during that same time interval. In its essence, the capacity of production is dynamic, and actually knowing this capacity allows the production tasks to be substantiated, the internal reserves to be discovered and justly evaluated, the need or excess of production factors to be sized, the solution for organising the most appropriate production to be chosen.

The definition almost unanimously accepted deems the capacity of production as being the maximum production that may be achieved during a period of time for a certain structure and quality of production, under the conditions of fully, intensively and extensively using the production factors, according to the most efficient work regime and rational organisation of the production and work.

When calculating the capacity of production, a series of factors are excluded, such as: the existence of narrow locations, lack of marketing, accidental down-times in the production processes, etc.

Unlike the effective or programmed production that is based on the actual conditions existing in the company during that specific period, the capacity of production highlights the maximum production possibility under the conditions of fully, intensively and extensively using the production factors and is usually stated by the physical volume of the company’s finished production (it is measured in the same units: t; pcs, sqm; cbm, etc.).

There are also some exceptions: if a large number of types of variably structured finished products results from the same production factors processed in a plant, the capacity of production is stated as the quantity of material production factors subject to processing; when the production is performed in a varied range of types, but it can be stated as an equivalent product, the capacity of production will be set forth as equivalent size; for those products or groups of products consisting of a large number of standard sizes, the structure of which represents significant changes over time, the capacity of production is stated in value; for those companies with seasonal production, the capacity of annual production is set for the duration of the accomplished or scheduled work campaign.

The size of the production capacity is influenced by two categories of factors, namely:

- **Direct Factors**: Appearing directly in the formula for calculating the production capacity are:
  - The number of machines and the size of the production areas, which are directly proportional with the size of the production capacity. In order to calculate them, only those machines, equipments, aggregates, work areas, etc. are taken into account and are intended exclusively for industrially productive purposes and directly compete with making the finished product. The machines in operation are taken into account, regardless whether they operate or not, whether they are repaired or modernised, including those that will be commissioned during the year. The following are excluded: The machines in the service and tool departments, as they only serve for creating the conditions necessary for achieving the production and not directly for executing it; the spare machines because they are intended for replacing those that are repaired; the preserved machines and those not corresponding to the company’s production structure.

Determining the capacity of production in industrial companies is done according to the capacity of the machine, group of machines, production area, plants or departments that are part of the directing link, defined as that production link that is of major importance in making that
Related Content

Fuzzy Optimal Approaches to 2-P Cooperative Games
www.igi-global.com/article/fuzzy-optimal-approaches-to-2-p-cooperative-games/168604?camid=4v1a

A Fuzzy Inventory Model for Weibull Deteriorating Items with Price-Dependent Demand and Shortages under Permissible Delay in Payment
www.igi-global.com/article/a-fuzzy-inventory-model-for-weibull-deteriorating-items-with-price-dependent-demand-and-shortages-under-permissible-delay-in-payment/93015?camid=4v1a

Technical Analysis and Implementation Cost Assessment of Sigma-Point Kalman Filtering and Particle Filtering in Autonomous Navigation Systems
www.igi-global.com/chapter/technical-analysis-implementation-cost-assessment/43631?camid=4v1a

Retailer Ordering Policy for Deteriorating Items with Initial Inspection and Allowable Shortage Under the Condition of Permissible Delay in Payments
www.igi-global.com/article/retailer-ordering-policy-deteriorating-items/62989?camid=4v1a