Chapter 3
The Constructive and Technological Preparation of Production

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ABSTRACT
Making any industrial product requires a good constructive and technological preparation of the production process by means of which that product is obtained. To start with, it is necessary to codify and classify the products by using various methods such as ABC, OPTIZ, CETIM PNG, etc., and the constructive preparation of production implies the use of an appropriate methodology mainly based on the product functions. The products can be the result of the production process achieved by integrating the production, which is always based on a multi-criteria decision. Regardless of whether production is integrated or not, it is necessary to schedule the production by shaping based on the deterministic models with the discreet and continuous structure or on the probabilistic models with the discreet and continuous structure. The technological preparation of scheduled production manufacturing is based on the economical-mathematical models and uses the matrix of multi-criteria manufacturing consequences. In order to select the best manufacturing system, the simulation of the production processes may be applied by using a simulation model in order to schedule the production by using appropriate production technologies. The quality of any manufactured product determines a certain level of related costs, and a product of inappropriate quality determines costs of non-quality both at the manufacturer and user of that product.

DOI: 10.4018/978-1-4666-2818-2.ch003
THE CODIFICATION AND CLASSIFICATION OF PRODUCTS

Industrial companies manufacture a lot of products, which is why they naturally seek to finally codify such products, in order to facilitate the treatment of the information related thereto.

The codification is the object of rigorous studies and it is required for various reasons, as follows:

- It allows for the rationalisation of the process of identification of products. Most industrial companies manufacture some thousands of industrial products;
- It is determined by the necessity of a classification of products manufactured in thousands of copies, so that they should be found relatively easily when required, based on several criteria, such as: the criterion of the relative costs of various products, the criterion of morphological similitude and the criterion of the final destination thereof;
- It allows for a homogeneous approach of the information identifying products, both inside and outside the company.

The codification must respond to a precise goal, i.e. meet at least two important requirements: the rational identification of products and their classification according to a single criterion. (Dima & Vilkul, 2006) Any codification system is characterised by: precision, i.e. each product must have a single reference, but each reference must be codified for a single product; suppleness, i.e. a good codification system must allow the easy introduction of new references without affecting the logic of the codification system; homogeneity, i.e. the code must be homogeneous through the number of characters it compares, be they digits or letters, through its structure and composition, avoiding as much as possible any errors caused by incomplete characteristics; timeliness, i.e. it has to be conceived so as to last for various years.

The most frequently used codification systems are the following:

- **The System of Analytical Codifications:** Which ensures the inclusion of the main characteristics of a product as a component of its codification. Such a codification is very complex, including alphanumerical codification. It allows for a possible classification of products starting from the code, and the easiest to remember code is a sequential code;
- **The System of Sequentially Chronological Codifications:** Which only uses a single range of alphanumerical characters. Thus, products are recorded as soon as they have entered the stock or they have been allocated to production. Therefore, there is a minimum number of busy codes and codification may have a short length. The system provides timeliness and a low number of characters within the code.
- **The Combined Codification System:** Which uses codes made up of two parts: an analytical and a sequential one. The analytical part stays as global as possible, as a general rule of this type of codification. A lot of attention is needed in choosing the analytical part of the code for ensuring the suppleness and timeliness of the system.

Irrespective of the chosen system of codification, a verification key for each code must be made. There are several methods for establishing the verification key: multiplying results by three, summing up the value of even characters in the second part of the symbol, summing up to the previous result, etc.

If work is made on a given code with a certain verification key, the exactness of the code is verified systematically and there are low chances that codification errors might appear.
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