

ON THE REQUIREMENTS FOR OPERATIONAL PLANNING SYSTEMS FOR INDUSTRIAL PRODUCTION

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Abstract: The article analyzes and systematizes the requirements of potential and real users to computer systems for operational planning and production management. There is a particular attention to production systems of the “Advanced Planning and Scheduling” (APS) class, which have a high degree of integration with the systems of the “Manufacturing Executable Systems” (MES) class. There is also a brief overview of the reasons for the creation of APS systems, as well as their general ideology and conceptual problems in the development. A number of key requirements for APS systems are considered, as far as possible, in the order in which they arise both during the development and the operation of these systems. The article was based on the long-term interaction of its authors with representatives of manufacturing enterprises of various sizes, belonging to different industries located in Russia and the countries of the Commonwealth of Independent States. This interaction was carried out as a part of the implementation of the “Zenith SPPS” information system in the pilot and industrial operation.

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In the course of the development of information systems for managing the activities of enterprises and organizations, the functions that make it possible to optimally and quickly distribute the use of certain resources in time are becoming increasingly important. In this article, there are the requirements for planning information systems intended for use in single or small-scale production. The planning problem arises regularly in these industries, since the production process is difficult to reduce to monotonous overlapping material flows.. There are the following important conditions for the need for operational planning:

- large range of manufactured products with a variety of technological processes;
- technological complexity of manufactured products;
- large number of production orders.

Our experience of interaction with industrial enterprises [1] shows that when creating information management systems, the resources of an automated object can be conveniently divided into the following groups: human, material, financial, information, and time resource. At the same time the information one may be any resource not belonging to another group. Usually, the information resource is the documentation of the enterprise, as well as technology and controls. With this approach, each group of resources has pronounced features that distinguish it from any other group.

Correction of the generated order in the Zenith TECH application

Zenith TECH 1.6 - Order2691Eng

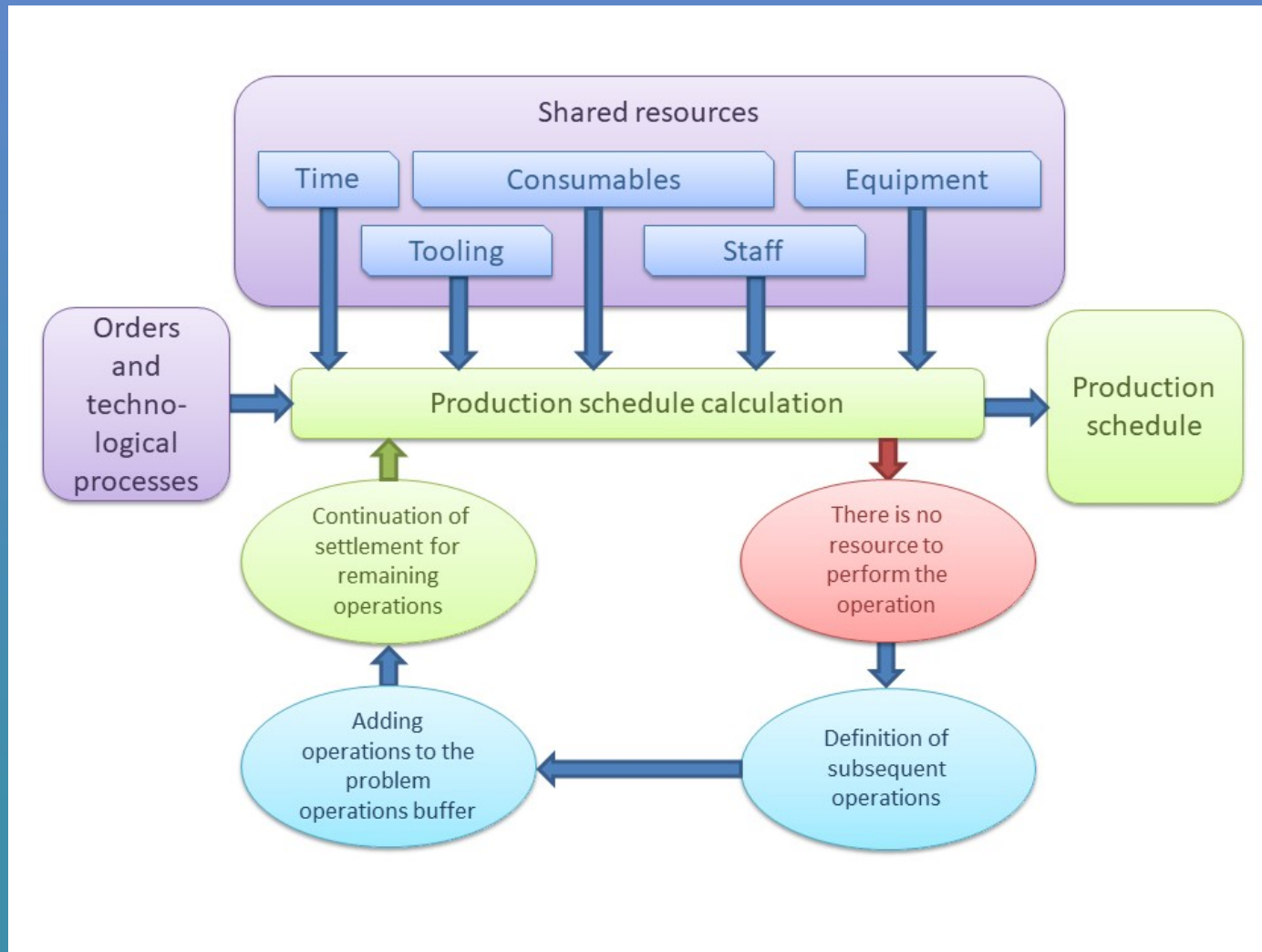
File Edit Tools Help

The screenshot displays the Zenith TECH 1.6 application interface. On the left, a tree view shows a Manufacturing Order 2691 (dated 18.11.19) with several assembly levels. The selected item is '010 Cutting/CHP/.../TYPE1/_/F-R/_'. The right pane provides details for this operation:

- Name:** 010 Cutting/CHP/.../TYPE1/_/F-R/_
- Kind:** Operation (selected, with other options: Order, Material, Product, Recyclable waste, Component, Half-finished)
- Volume:** 120
- Unit:** pieces
- Type of work:** Cutting/CHP/.../TYPE1/_/F-R/_
- Dependency:** Finish-start
- Lag:** [] hr.
- Assembly name:** []
- Comment:** 010 Cutting/CHP/.../TYPE1/_/F-R/_ 120 pieces

Manufacturing Order 2691 (18.11.19) As28.451.400 M1/15.15 As28.251.408/15.15 Cutting/CHP/.../TYPE1/... 03.02.2020

Correction of the generated order in the Zenith SPPS APS system



End users require versatile, powerful, and easy-to-use operational planning systems for industrial production. A significant amount of various technical requirements is presented to these systems. A constant analysis of these requirements and the identification of common patterns from them allow creating and developing universal planning systems that are applicable not only in industrial production, but also in other systems that manage the resources. The main problem in developing such systems is the need to create complex, but at the same time universal and fast data processing algorithms.

Thank you for your attention!