https://doi.org/10.26160/2474-5901-2019-17-157-160

DEVELOPMENT OF PROGRAM COMPLEX OF THE AUTOMATIC WORKING PLACE FOR STEEL-SMELTING SHOP TECHNOLOGIST

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Keywords: automatic working place, software complex, information technologies, steel-smelting production.

Abstract. Program complex development experience of the automatic working place for steel-smelting shop technologist. Technological receipts and modern realization means used when software development are described.

РАЗРАБОТКА ПРОГРАММНОГО КОМПЛЕКСА АВТОМАТИЗИРОВАННОГО РАБОЧЕГО МЕСТА ТЕХНОЛОГА СТАЛЕПЛАВИЛЬНОГО ЦЕХА

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Ключевые слова: автоматизированное рабочее место, программный комплекс, информационные технологии, сталеплавильное производство.

Аннотация. Приведён опыт разработки программного комплекса автоматизированного рабочего места технолога сталеплавильного цеха. Описаны технологические приемы и современные средства реализации, используемые при разработке программного обеспечения.

At present, one way to improve the efficiency of metallurgical production resource management subsystems is to use computer-based decision support systems. In this regard, it is necessary to develop a specialized information tool that allows to obtain products that meet the customer 's requirements without additional costs on the basis of known mathematical models, taking into account the influence of technological parameters [1].

Using the system approach, it was possible to model the functional structure of the software complex, identify its actions and the links between these actions, control the actions and mechanisms of each function (fig. 1) [2].

Consider a software module designed to determine the composition of charge and alloying materials [3].

The software module «Determination of charge and alloying materials» allows to perform the following tasks:

- determination of mass of pure chemical elements;
- determination of preliminary alloy composition;
- recommendations for selection of charge materials.

The results are displayed in tabular and graphical forms (Fig. 2-3).

The following components are shown in the present form:

- window for steel mass entry, t;
- assignment of ferroalloys and additives through the drop-down list regulated by GOST and TU.

The results obtained, presented as a pie diagram, demonstrate the contribution of each chemical element as a percentage of the total alloy composition. The process of creating the architecture of the software module for determining charge and alloying materials was carried out on the basis of the following principles:

- completeness;
- responsibility.

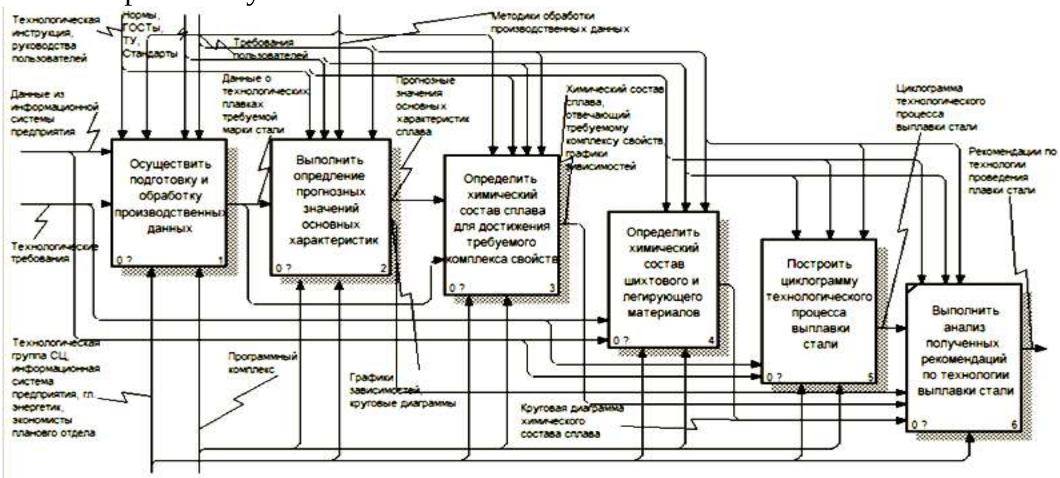

Fig. 1. Functional model of production resources management subsystem

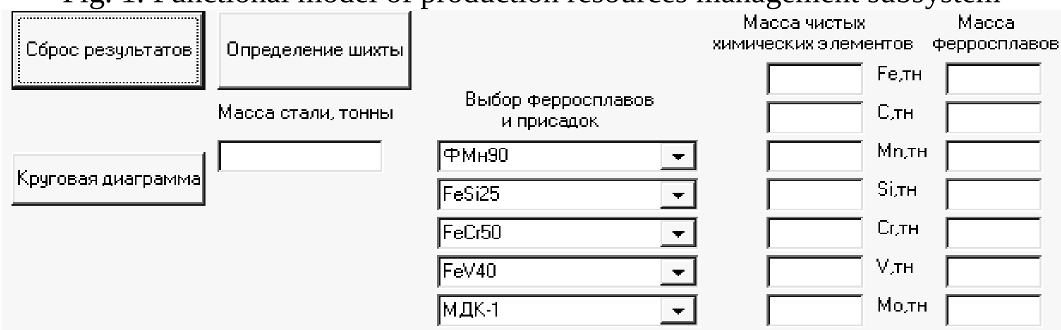

Fig. 2. Display of quantitative results of alloy composition determination

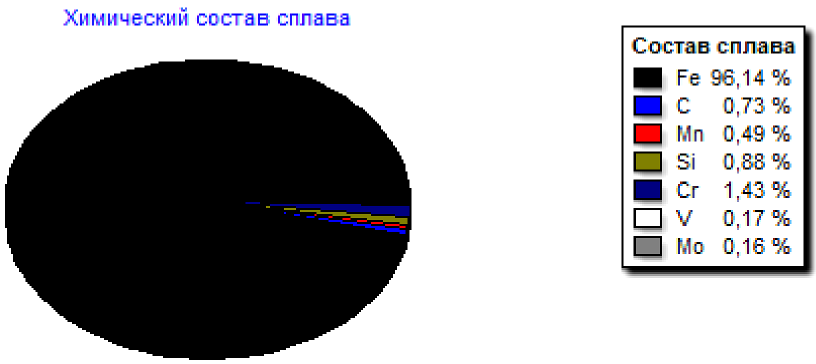

Fig. 3. Graphical presentation of the results

The principle of completeness of architecture means that it must define classes that implement all high-level functions of the program, in particular, interaction with the user, access to data, display of calculation results, encapsulation (concealment) of the method of calculation of composition of charge and alloying materials. The architecture of the module for determining the composition of charge and alloying materials is shown in figure 4.

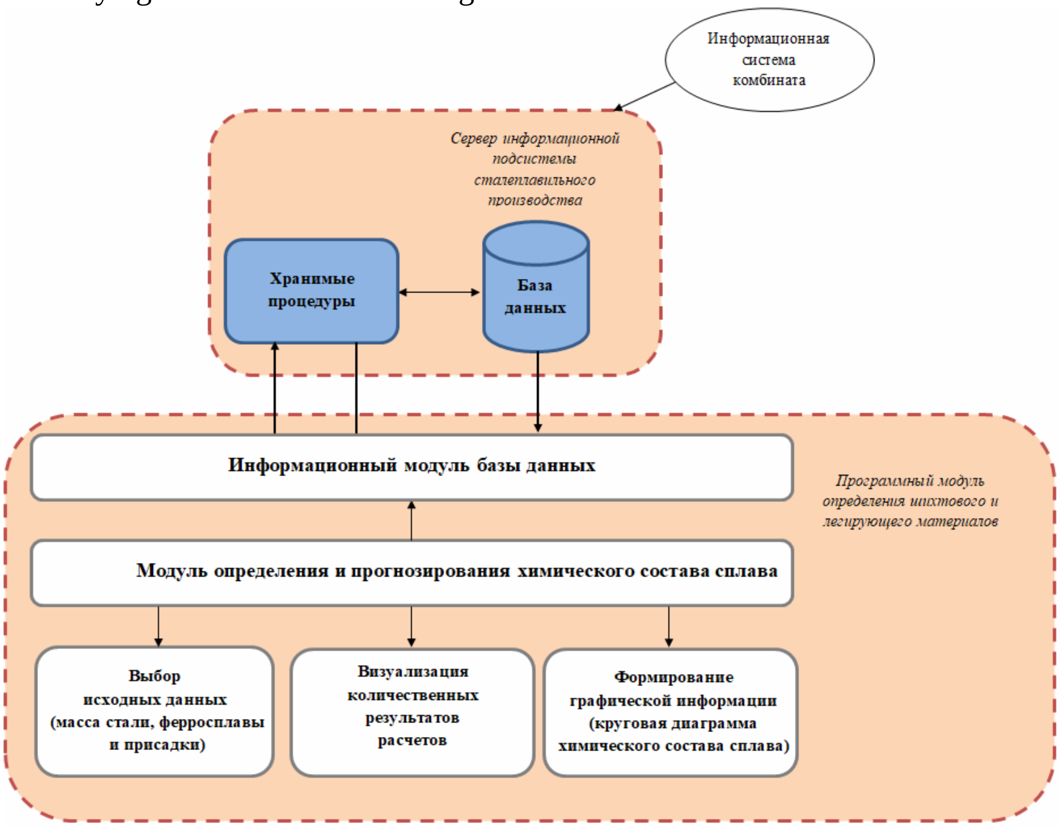

Fig. 4. Architecture of the module for determining composition of charge and alloying materials

In the experimental evaluation of the efficiency of application of the developed software, it was found that the results obtained using the software module «Determination of charge and alloying materials» are used during the charge laying at the initial stage of the steel smelting process in the furnace EAF-50 [4].

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Received 17.12.2019