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MATHEMATICAL MODEL OF OPTIMIZATION OF PRODUCTION SYSTEMS WITH
CIRCUITS RESOURCE FEEDBACKS

The potential effectiveness of the production system is determined by the efficiency of technology and products, but real results essentially depend on relationships with the surrounding environment, resource providers, consumers and competitors. Accounting of these ties is a necessary condition of the adequacy of production models. The main disadvantages of analogues - problems dimension and alienation from the user's creativity when working with a CAD package. In [1] the problem of optimal aggregation for single-circuit system with resource feedback (RFB) was posed and solved. In this paper, put a new task of the development model and optimal method of aggregating production systems taking into account multiple resource feedbacks. Interpreting these linkages: internal combustion technology in recycling of agroindustry waste, consumption, interaction with customers, suppliers, competitors and employees.

In theoretical terms, the novelty of this work is an extension of basic algebra optimal aggregation due to introduction of a parameterized associative binary operator optimal aggregation structures RFB. Unlike methods - analog, in the methodology of optimal aggregation critical stage to build a model of the production system (PS) as a technological converter "resource - product". In Fig. 1 submitted this design phase. In Fig. 1a - basic resource structure of the PS with a feedback (FB). In Fig. 1b - structure of the production system with two feedbacks. In Fig. 1c - the structure of the production system (Fig. 1b) is displayed in the binary tree of optimal aggregation of system. Binary tree - formula solutions basic tasks of functioning and development of production systems. Result solutions - optimal of the equivalent function of the production system with two feedback circuits. Studies obtained mathematical models that reproduce the empirical data as well as allow you to reproduce the processes of operation and development of properties, which are not captured by the standard statistics.

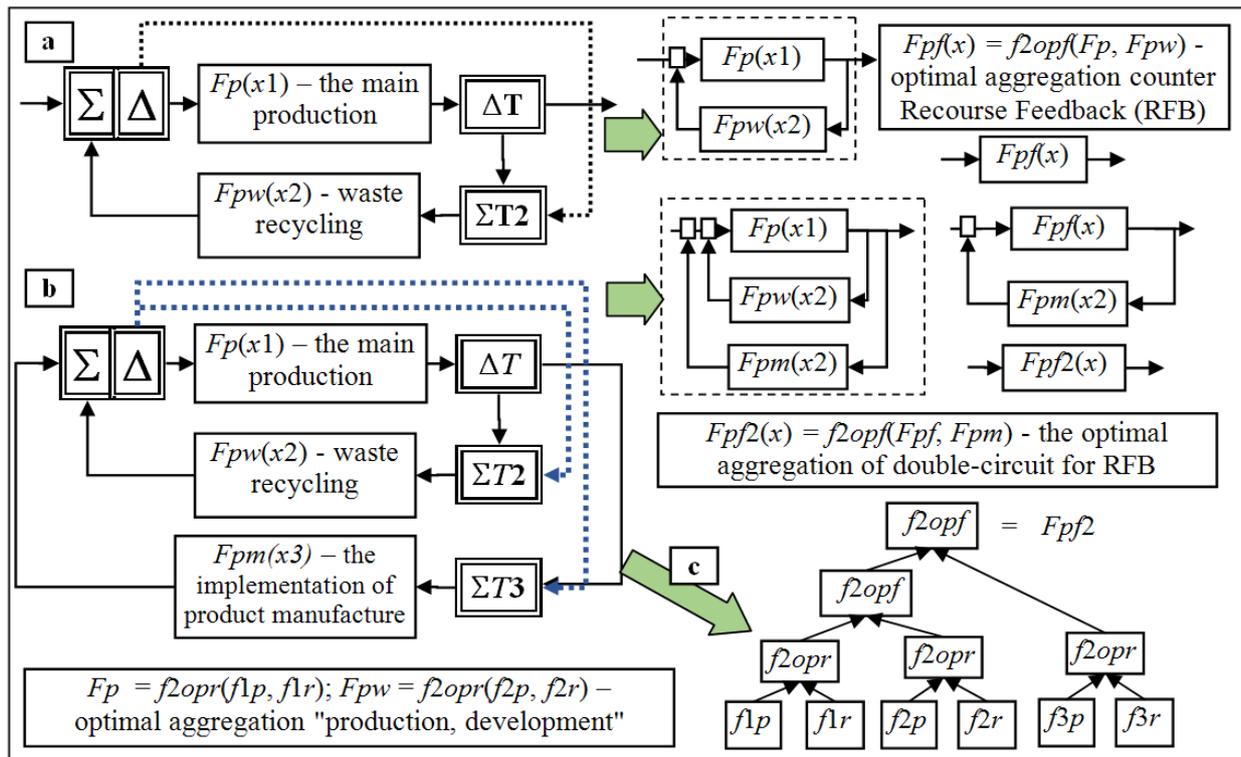


Fig. 1. The optimal aggregation of production system with two circuits. Example

References

1. Borovska, T. N., Kolesnik, I. S., Severilov, V. A., Severilov, P. V. (2014). Optimal models of innovation development production systems. Eastern-European Journal of Enterprise Technologies, 5(2(71)), 42-50. DOI: 10.15587/1729-4061.2014.28030.