

## ANALYTICAL FORMALIZATION OF THE PURPOSE OF THE SYSTEM OF MAINTENANCE OF AGRICULTURAL MACHINERY

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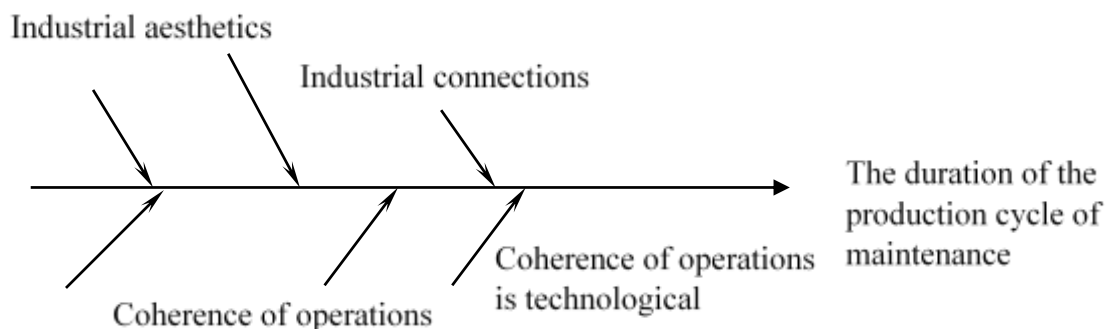
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Solving the problems of the efficiency of the maintenance system of agricultural machinery is impossible without appropriate scientific support, which is currently insufficient. The solution to the problem lies in the plane of modeling the service system of such organizational, technical and technological conditions under which the service is effective. Theoretical studies of the system should answer two main questions - how should the system change depending on the level of development of agricultural production, as well as – what parameters should it have as a system of service and repair service to perform appropriate interventions with minimal technologically necessary resource costs and investments [1-3].

However, the definition of system parameters and its development should be based on clearly formulated scientific principles: systematics, subject-technological approach, mathematical modeling [4], risk justification, optimization and forecasting [5]. And according to the author of the article, the formalization of the purpose of the system itself.

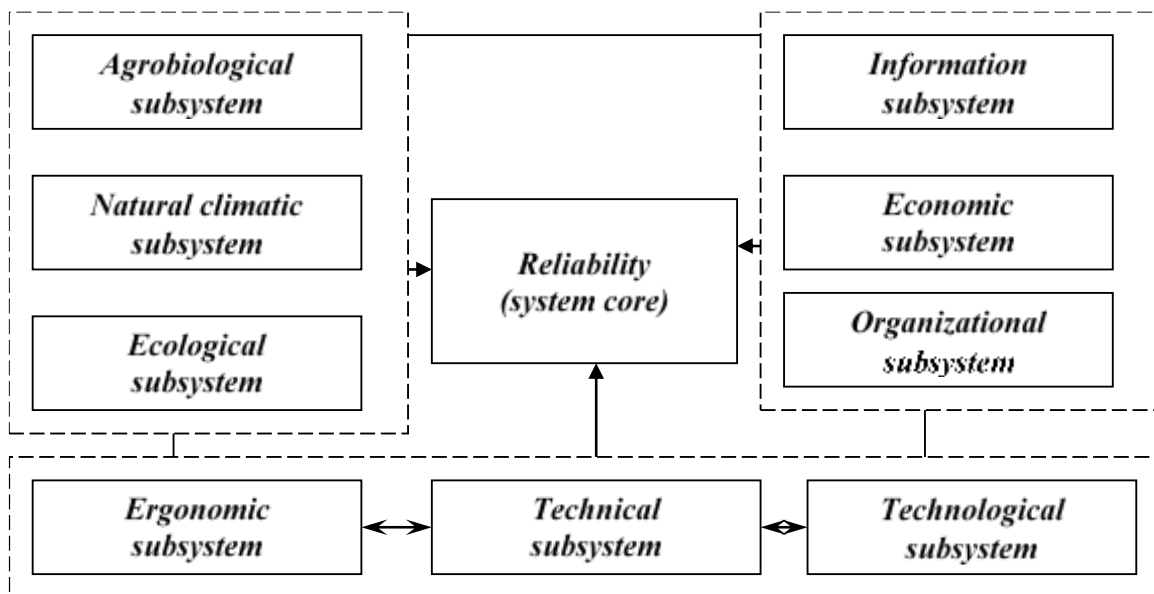
Formulation of the goals of the article. Record the provisions of the analytical description of the formalization of the purpose of the maintenance system of agricultural machinery.

The system of maintenance of agricultural machinery has its own special mission, in which this system goes beyond agricultural production and directly affects the design and production of agricultural machinery (Fig. 1) through many alternative functional schemes of the main production component:  $f = (f_1^s, f_2^s, \dots, f_n^s) \cup (f_1^p, f_2^p, \dots, f_k^p)$ , where  $\cup$  - the sign of disjunction ("or" logic),  $f_1^s, f_2^s, \dots, f_n^s$  and  $f_1^p, f_2^p, \dots, f_k^p$  - production factors.



**Fig. 1. Influence of production factors on maintenance.**

Summarizing the scientific experience, we have formulated a hierarchical system for forming an assessment of the intensification of maintenance of agricultural machinery (Fig. 2). The core of the system is a generalized criterion of reliability. Each subsystem has its own differences and features and is interconnected with others. In general, the system is a complex technical system that has the properties of associativity, reflectivity, heterogeneity and emergence.



**Fig. 2. Evaluation system for intensification of maintenance of agricultural machinery**

Natural and climatic: terrain; soil strength; soil properties; altitude.

Agrobiological - soil weeds, field configuration.

Technical: preparation of machines for work; maintenance mode; parts recovery system, storage mode; required quality of fuels and lubricants, provision of spare particles; certification of equipment and technical service.

Organizational and production: structure of production assets; machine system structure; workloads and downloads; technical operation management; application of rent, contract, leasing; joint use of equipment, updating of machines, choice of technological complex, choice of process parameters, use of time of change, modes of technological service; ways of movement of machine-tractor units, speed mode

Sociological: labor protection, labor organization, production certification, motivation for the production of the final product, information support, personnel and infrastructure.

The subsystems combine more than 60 factors. It is possible to

objectively estimate this complex set only by multicriteria optimization. The qualimetric basis of assessment with a significant number of metrological and qualitative criteria, which are characterized by differences and physical content, is the justification of the coefficients of "dominance" or "desirability" with their change from 0 to 1 with the resulting comparison of data on an arbitrary solution. The method of calculating the coefficients was developed in the works of RL Kini. The generalizing criterion is calculated according to the private coefficients of "dominance", according to which the adaptability of maintenance technologies with unified and generalized processes for machines of all types and brands is proposed on a single scientific and methodological basis:

- subsystem typification ensures the implementation of all types of technology to maintain agricultural machinery in working order with optimal labor costs, time, materials, resources and energy resources;
- subsystem of specialization provides all types of maintenance of machines operated by different owners;
- operational technologies are adapted to the maintenance process;
- subsystem of parametric series of executions at the expense of block-modularity and variable-blockiness, taking into account complexity and various purchasing power of the owner of cars.

### ***References***

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