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AUTOMATED SYSTEM OF STATISTICAL ANALYSIS AND MODELING TECHNOLOGICAL PROCESS

***Abstract**: The developed automated system of statistical analysis and modeling of the technological process allows to solve the problems of statistical evaluation of technological factors and highlighting technology factors from the total volume, having a significant impact on the selected quality indicators of the finished product; tasks of constructing mathematical models of the connection of factors and quality indicators, as well as forecasting output properties in the conditions of changing parameters of the technological regime.*

***Key words**: Automated system, statistical analysis and modeling, technological process.*
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Introduction

Automated system of statistical analysis and modeling technological process

Automated system of statistical analysis and modeling technological process must be a single module, in which various subtasks are solved, where it is important to obtain consistent results of various subsystems of a single system [1,2,3,4].

The overall functionality of the structure of the automated system is shown in Figure 1.

In accordance with specific objectives and solvable tasks in the composition of the developed system the following functional subsystems should be included:

- subsystem of statistical analysis of technological information designed for elimination of zero, erroneous data and gross errors, distribution normality checks, calculation of sample parameters[5,6,9].;

- modeling subsystem technological process designed to analyze the effect of technology on properties, highlighting the main technological factors, selection of optimal functions connection factors and properties, as well as for constructing mathematical models by various methods. Should be carried out assessment models, i.e. checking their adequacy by researching residues, then prediction of properties according to various technological modes;

- subsystem design and analysis of graphs. Designed to analyze statistically significant relationships between technological factors and responses;

- subsystem for forecasting quality indicators and analyzing the influence of factors on responses.

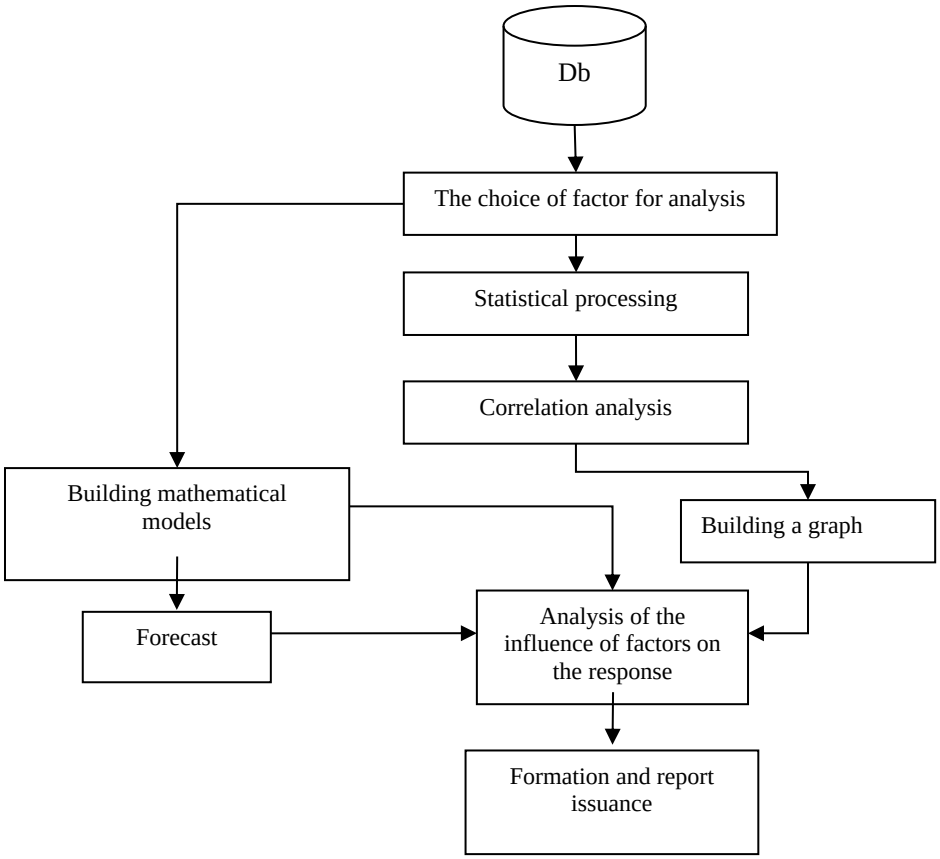

Fig. 1. General functionality of the structure of an automated system

In accordance with the specific goals and objectives of management as part of the developed automated system statistical analysis and modeling of the technological process should include the following functional subsystems[7,8,10].:

subsystem of statistical processing of technological information:

getting source data;

screening out gross errors and zero values in the source data;

calculation of statistical sampling parameters;

subsystem modeling technological process:

- building paired linear and nonlinear models;

correlation analysis;

- building multiple models;

model evaluation;

- highlighting the main technological factors and related quality parameters with them;

Subsystem quality indicators forecast:

the forecast indicators of quality;

analysis of the influence of factors on responses.

Subsystem graph building and analysis:

building graphs based on correlation coefficients between the source data;

- display statistically significant relationships between technological factors and responses;

output of results in a form convenient for users of the system.

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