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MODELS AND ALGORITHMS OF THE INTEGRATED INFORMATIONAL SYSTEM BASED ON THE ANALYSIS OF EFFICIENCY OF ITS FUNCTIONING

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ABSTRACT Of Master's thesis
for a master's degree

GENERAL CHARACTERISTICS OF WORK

The relevance of the research topic. At the beginning of the XXI century, radical changes began in those conceptual provisions that determine the main directions for the further development of the telecommunication system as a part of the integrated information system of the enterprise. The idea of building a next-generation communication network, known by the abbreviation NGN (Next Generation Network), was formed. The majority of specialists consider the idea of NGN to be the most reasonable concept of the further development of the info communication system - the symbiosis of telecommunications and informatics.

Theoretically, the conception of NGN can be realized in the process of development of any telecommunication network currently operated: telephone, data exchange, cable TV. Hypothetically, we can consider the idea of creating one more - a new one - a network that fully corresponds to the NGN concept. However, from a practical point of view, only NGN, which is based on the purposeful development of the public telephone network (PSTN), is of interest. When constructing NGN, it is necessary to take into account a number of specific properties of the telephone communication system. Among the changes in PSTN, it is necessary to single out the transition to packet transmission and switching technologies, which stimulate the development of new principles for building a network. One of the most important tasks contributing to the formation and implementation of these principles is the development of methods for calculating characteristics that allow analyzing the quality of traffic servicing in the NGN as a whole, as well as in its separate fragments.

In the light of the above, the theme of the thesis: "Models and algorithms of an integrated information system based on the analysis of the effectiveness of its functioning" is extremely relevant.

The aim of the work is to improve the efficiency of the telecommunication component of the integrated information system, including reducing the time of connection of subscribers, increasing the efficiency of equipment distribution by access nodes, increasing the reliability of statistical data, eliminating the reasons for the loss of data on applications for connection of services, the reduction of the number of fictitious subscribers, analysis of the PSTN modernization principles, which are aimed at forming the next generation communication network (NGN) in accordance with the requirements of the main participants of info-communication market: users, operators, manufacturers of hardware and software, service providers.

To achieve this goal, it is necessary to solve a number of problems:

1) Analysis of fixed and mobile telephone networks, including telephone communication systems, hierarchical levels in PSTN, city telephone networks, telecommunication networks.

2) Analysis of the principles of functioning of mobile communication networks, including the GSM cellular network.

3) Analysis of the principles of construction and operation of the next generation NGN network, the formation of a generalized structure of the telecommunication network.

4) Analysis and selection of mathematical models and algorithms for assessing the effectiveness of the technological infrastructure of the information system of the city telephone network operator.

5) Analysis of the network capacity and its elements, service efficiency indicators.

6) Analysis of the structural characteristics of power lines.

7) Analysis of backup processes in the info-communication system.

8) Modeling of the automatic switching center load.

9) Failover Modeling.

10) Modeling of routing in telecommunication networks.