

## ABSTRACT

Master dissertation: 95 pp., 27 fig., 2 tab., 1 app., 50 sources.

**Topicality.** In the modern world, the volume of information is doubling annually, and at the same time the speed of doing business is increasing. To be successful, a modern company has to not just operate large volumes of data, but operate them quickly and efficiently.

Data center (data center) is a fault-tolerant integrated centralized system that provides automation of business processes with high level of productivity and quality of provided services. Addressing large-scale information tasks, most companies face uncontrolled rising costs and lower efficiency in IT investments. The construction of data centers and the consolidation of IT resources provides a qualitative leap in the development of corporate systems, opening new opportunities for the implementation of the most advanced efficient technologies.

The design of the data center is performed taking into account the solvable business tasks, the level of security requirements, the use of existing equipment, and is embodied in the architectural and technical decisions of the project. This approach allows for the creation of protected heterogeneous data processing centers, consisting of hardware and software from various manufacturers, including legacy customer systems. In order to ensure that the requirements of users are constantly adhered to minimizing costs, it is a problem of forecasting the server system resource requirements in cloud computing.

In this regard, it is important to develop an algorithm for forecasting the demand for resources of the server system in a cloud computing environment, which will more accurately predict the system's load.

**Relationship of work with scientific programs, plans, themes.** The research was carried out at the Department of Computer-Aided Management And Data Processing Systems of the National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute» within the theme «Development and implementation of

an IT infrastructure management system with consolidated information and computing resources» (№ 0115U000322).

**The aim of the research** is to improve the quality of prediction of resource requirements for the server system by developing a prediction algorithm to increase the accuracy of forecasting the load of the server system.

To achieve the goal, the following tasks must be performed:

- analyze the methods of predict resources of the server system
- develop an algorithm for predict the server system resource requirements;
- develop the software implementation of the algorithm;
- develop the software implementation of the reinforcement learning algorithm;
- make a research of developed algorithm effectiveness.

**The object of research** is a process of predicting resource requirements for a server system in a cloud computing environment.

**The subject of research** are predicting methods and algorithms necessary resources for server system in a cloud computing.

**Research methods** are predicting methods based on autoregressive models and neural networks.

**Scientific novelty of the obtained results.** The possibility of using forecasting methods to predict the loading of resources for the server system in the conditions of cloud computing is analyzed. The mixed forecasting method is developed, based on autoregressive models and neural networks. The developed algorithm takes into account changes in the load on the central processing unit of the CPU and the accuracy of forecasting of the methods in the previous step in order to increase the accuracy of the next steps of forecasting. The proposed algorithm is based on autoregressive models, autoregression of the moving average, integrated automorregression of the moving average and the method of group consideration of arguments allows to determine the optimal policy of controlling the modes of operation of the physical server without prior information on the load.

**Publications.** The materials of research are published in the theses of the 10th All-Ukrainian Scientific and Practical Conference "Computer Intelligent Systems and Networks" [3]; published in the theses of the 18th All-Ukrainian Student Scientific and Practical Conference "Science and Technology of the XXI Century" [4]; published in the theses of the scientific-practical conference "Informatics and Computing Technology-IOT-2018" [5]; published in the journal "Scientific News of Daliv University" [6]; published in the journal "Actual research in the modern world" [7].

PREDICTING, AUTHORIZATION MODELS, GROUP CALCULATION  
METHOD OF ARGUMENTS, SERVER SYSTEMS, CLOUD COMPUTING,  
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