пришвидшити час, знизити витрати і покращити прозорість операцій виконання закупівель.

Вважаємо, що запропонована процедура закупівель через удосконалення програмного забезпечення в умовах підприємств гірничо-металургійного комплексу (Активів групи ТОВ «МЕТІНВЕСТ ХОЛДИНГ») та ТОВ «МЕТІНВЕСТ БІЗНЕС СЕРВІС». здатна забезпечити збільшення ефективності за рахунок чіткого розподілення зон відповідальності; зменшення трудовитрат; уніфікації номенклатури, автоматизації процесів формування потреб від замовника; зменшення помилок в розрахунку потреби; підвищення швидкості виконання замовлень та обробки заявок; зниження ризиків вимушених простоїв виробництва, у т.ч. при форс-мажорних обставинах.

**Перелік використаних джерел**

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## MODERN TOOLS FOR PREDICTIVE BUSINESS ANALYTICS

## СУЧАСНІ ІНСТРУМЕНТИ ПРОГНОЗНОЇ БІЗНЕС-АНАЛІТИКИ

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The increasing need for analytical support in managerial decision-making demands continuous enhancement of predictive analytics tools to process, interpret, and visualize large datasets. These technologies enable tracking trends within the business environment, assessing potential risks, and making

more informed decisions. Substantial contributions to identifying these trends have been made in recent years, especially in forecasting approaches within data analysis, machine learning, and neural networks [5].

Among the basic predictive business analytics methods are interactive visualization tools such as Power BI and programming languages like R and Python, which allow for the implementation of complex analytical scenarios. Power BI provides the capability for seamless integration with other Microsoft products, offering visual data representation in dashboards. This tool is considered highly user-friendly due to its intuitive interface and support for interactive reports, which significantly enhances data accessibility for decision-making. However, in the world of big data, the Power BI tools have become restricted. In contrast, R and Python are geared toward more in-depth analytical processing. Specifically, they offer functionality for time series analysis, classification, regression, and the development of machine-learning algorithms. These tools provide flexibility for building unique predictive models and are widely used for analyzing business trends. Python's advantage includes integration with TensorFlow, PyTorch, and other tools for developing neural networks, allowing work with large datasets and addressing complex forecasting tasks [2]. According to [1; 4], simulation and machine learning tools of predictive business process analysis completion times are more accurate. Specifically, tools based on classification methods have been showing better results in terms of precision, which is crucial for business processes that require strict adherence to deadlines. For complex and systemically related problems, mathematical and computer simulation is an integral attribute of practical solutions.

Another effective IT tool for analysis is Orange Data Mining (https://orangedatamining.com/), which supports visual programming and enables the rapid creation of analytical scenarios without deep programming knowledge. This tool, along with other similar solutions, provides a bridge between the capabilities of analytical programming languages and classic office programs. This platform allows for integration with Python, extending possibilities for analysts and providing capabilities for convenient visual analysis, data validation and preparation, clustering, and other methods for preliminary data exploration.

Interpretable machine learning is also actively used to deliver forecasts and explanations, contributing to strategic decision-making. For instance, the study by [6] demonstrates using interpretable models for predicting digital transformation, enabling reliable forecasts and insights into the factors most influencing outcomes. Thus, interpretable machine learning technologies

build trust in models and facilitate their integration into business environments.

Based on all the studies presented, modern predictive analytics tools, including Power BI, R, Python, and Orange, machine learning methods, and neural networks, are critically important for business analysis. They enable organizations to adapt business models to dynamic market conditions and create a foundation for data-driven strategic decisions. On the other hand, the complications of methods and approaches to predictive analytics are solved by using simplified visual methods and IDE programming languages (Python, R).

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