PROKOFIEVA Kateryna
Cand. Sc. (Economic),
Associate Professor at Department of Management, Business and Administration
Simon Kuznets Kharkiv National University of Economics

ANALYTICAL TOOLS AND INFORMATION PROCESSING TECHNOLOGIES FOR BUSINESS EFFICIENCY ASSESSMENT

In today's business environment, analytics is a key tool for improving management efficiency, optimising resources and ensuring sustainable development of the enterprise. The rapid pace of digitalisation and growth in data volumes requires managers to have deep analytical skills and implement Business Intelligence (BI) technologies [1].

Analytical tools are divided by functional purpose into typical, diagnostic, predictive, and evaluative. Typical tools (SWOT, GAP, and ABC/XYZ analysis) enable you to identify the strengths and weaknesses of an enterprise, assess the gaps between current and target results, and categorise customers or products by profitability.Diagnostic tools (correlation and regression analysis, trend models, scenario planning) are aimed at explaining the reasons for changes in indicators and predicting possible development trends. Forecasting methods (ROI, ROE, EVA, Balanced Scorecard) provide a comprehensive assessment of the efficiency of resource and capital use. Assessment tools (benchmarking, comparative analysis, competitor analysis) help position the company in the industry and identify areas for strategic improvement [2]. In terms of automation, analytics is divided into manual methods (such as Microsoft Excel and Google Sheets) and automated BI systems (including Power BI, Tableau, Qlik, Looker Studio, SAP BI, and Oracle BI).Manual methods are highly flexible and transparent, but are labour-intensive, limited in their ability to process large amounts of data, and slow to update.

Automated systems offer seamless integration with ERP and CRM platforms, automatic updates of indicators, the creation of interactive dashboards, and the application of machine learning algorithms to predict outcomes. Their advantages are scalability and reduced human influence. Depending on the depth of analytics, there are four levels: descriptive, diagnostic, predictive, and prescriptive. They answer the questions: what happened, why did it happen, what could happen, and what needs to be done. In this context, the combination of different levels of analytics forms a comprehensive management decision support system that integrates the description of facts, explanation of causes, and formulation of recommendations.

Methods of analytical data processing include statistical, economic-mathematical, financial, and digital-analytical approaches, each of which plays a distinct role in supporting data-driven management decisions.

Statistical methods - such as averages, variance, standard deviation, correlation, regression, factor, and cluster analysis - form the foundation of quantitative research and business analytics. They enable the identification of key patterns, relationships, and dependencies within data arrays. Using statistical tools, researchers and managers

can evaluate the stability of business indicators, detect deviations from the norm, and forecast future trends. For instance, correlation and regression analyses help determine the strength and direction of relationships between variables such as sales volume and marketing expenditure, while cluster analysis groups similar business units or consumer segments for more targeted management.

Economic and mathematical methods - including the modelling of interrelationships, linear and nonlinear programming, game theory, and sensitivity analysis - make it possible to simulate real economic processes, optimise the use of available resources, and assess alternative development scenarios. These methods provide the foundation for managerial decision-making under uncertainty and help determine optimal strategies for production, pricing, and investment. Sensitivity analysis, for example, enables the assessment of how changes in input parameters (such as raw material prices or interest rates) affect the final results, thereby supporting risk management and planning.

Financial analysis methods - such as ratio analysis, the DuPont model, comparative analysis, trend analysis, and cash flow analysis - allow for a comprehensive assessment of a company's financial condition, liquidity, solvency, and profitability. The DuPont model, in particular, provides a structured approach to decomposing return on equity (ROE) into its constituent factors (profitability, asset turnover, and financial leverage), thus identifying key drivers of financial performance. Regular application of financial analysis tools contributes to maintaining sustainable growth and detecting early signs of financial instability.

The integration of Business Intelligence (BI) technologies significantly enhances the analytical capabilities of an organisation. BI platforms collect, process, and visualise data from multiple internal and external sources, ensuring the creation of a unified information and analytical system. This system automates data aggregation, generates interactive dashboards and reports, and provides real-time monitoring of performance indicators. Through BI tools, companies can perform scenario modelling, predictive analytics, and data-driven forecasting, thereby supporting evidence-based strategic management.

Thus, analytical tools and BI technologies form the basis for the digital transformation of business performance management and contribute to increasing the productivity, flexibility, and competitiveness of modern enterprises. The systematic use of analytical tools ensures more effective management decisions, resource optimisation and timely response to changes in the external environment. The implementation of Business Intelligence technologies lays the groundwork for enterprises to transition to a data-driven management model, a strategic direction for the development of the knowledge economy.

List of references

1. Marr, B. (2023). *Data Strategy: How to Profit from a World of Big Data, Analytics and the Internet of Things*. Kogan Page Publishers.

2. Kaplan, R. S., & Norton, D. P. (2004). *Strategy Maps: Converting Intangible Assets into Tangible Outcomes*. Harvard Business School Press.