

СЕКЦІЯ 3.

ЕКОНОМІЧНА АНАЛІТИКА У СТРАТЕГІЯХ СТІЙКОСТІ БІЗНЕСУ В УМОВАХ НЕВИЗНАЧЕНОСТІ

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HYBRID AI-BASED SUPPORT FOR OPTIMAL CRISIS BUSINESS DECISIONS IN SHIVA ENVIRONMENT

The modern world economic system has finally transformed from a relatively predictable environment into a space of permanent turbulent crisis [1]. The former concepts of VUCA and BANI, which described the volatility, fragility and non-linearity of markets, are giving way to a more radical metaphor - SHIVA - the world. This acronym (Split - split, Horrific - terrible, Inconceivable - incomprehensible, Vicious - vicious, Alis - non-linear) characterizes the reality in which the destruction of old socio-economic institutions occurs like an avalanche. In such conditions, the depth of uncertainty completely excludes classical long-term planning, and traditional anti-crisis strategies and isolated analytical management tools instantly lose their effectiveness [2]. There is an objective need for technologies that are capable of not only processing chaotic flows of heterogeneous data in real time, but also flexibly taking into account the nonlinear human factor, therefore the most promising response to the challenges of the new reality is hybrid artificial intelligence, which organically combines the computing power of mathematical optimization, the adaptability of neural network models, and expert human intuition [3].

In the context of strategic management = hybrid artificial intelligence is perceived not as an isolated software algorithm, but as a developed socio-technical synergistic system, and the basic architecture of such an approach combines two fundamental components: symbolic intelligence, which works according to strict logical rules and expert bases, sub-symbolic (neural network) intelligence, including large language models and deep learning, as well as directly human intelligence. The latter provides expert support, qualitative risk assessment, ethical control and cognitive flexibility not available to machines. In the conditions of the SHIVA-world, where historical data

often lose relevance due to constant conceptual drift, pure data-centric AI begins to make critical mistakes, extrapolating outdated trends to fundamentally new anomalies. Therefore, it is the hybrid approach that successfully compensates for this systemic shortcoming: while deep neural networks reveal hidden patterns and correlations in market information flows, humans, together with evolutionary mathematical algorithms [4], [5], verify hypotheses for compliance with the company's global goals and strict constraints.

The process of making optimal anti-crisis decisions within such hybrid platforms is built according to an end-to-end adaptive scheme. At the data collection stage, neural network components continuously scan the external environment, recording weak signals, macroeconomic fluctuations and geopolitical risks; then, instead of building a single basic forecast, the system uses agent modeling and evolutionary (meta-heuristic) algorithms [6-8] to generate hundreds of alternative scenarios for the development of the crisis. At this stage, mathematical optimization methods are connected, such as: matrix game theory of conflict of interest conditions or stochastic programming etc [9-11]. Solution options generated by AI agents are automatically ranked according to the criteria of efficiency, costs and risks, after which the final choice and cognitive assessment of ethical or inappropriate aspects of the scenario remain with top management. The result of the human decision is returned to the system for continuous further training based on feedback mechanisms [12].

The main advantage of hybrid intelligent systems over traditional crisis management or fully autonomous algorithms is a unique balance of speed, flexibility and clarity. It is traditional management that has a critically low reaction speed due to lengthy coordination procedures, while pure AI suffers from the black box problem and a high tendency to hallucinations in non-standard situations. Hybrid AI, on the contrary, automates the routine analysis of colossal amounts of information, leaving the function of the final filter and adherence to the strategic goal to humans - this ensures high business stability in conditions of acute shortage of high-quality historical data and allows for timely response to nonlinear threats.

In conclusion, it should be noted that the transition to the SHIVA-world requires a fundamental break in management paradigms: in other words, organizations that rely exclusively on human resources inevitably lose in the speed of processing changes, while blind trust in autonomous algorithms in conditions of permanent chaos can lead to catastrophic operational failures. It is hybrid artificial intelligence that acts as the most balanced technological framework for modern business, transforming the destructive challenges of the macro environment into controlled, mathematically optimized tasks.

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