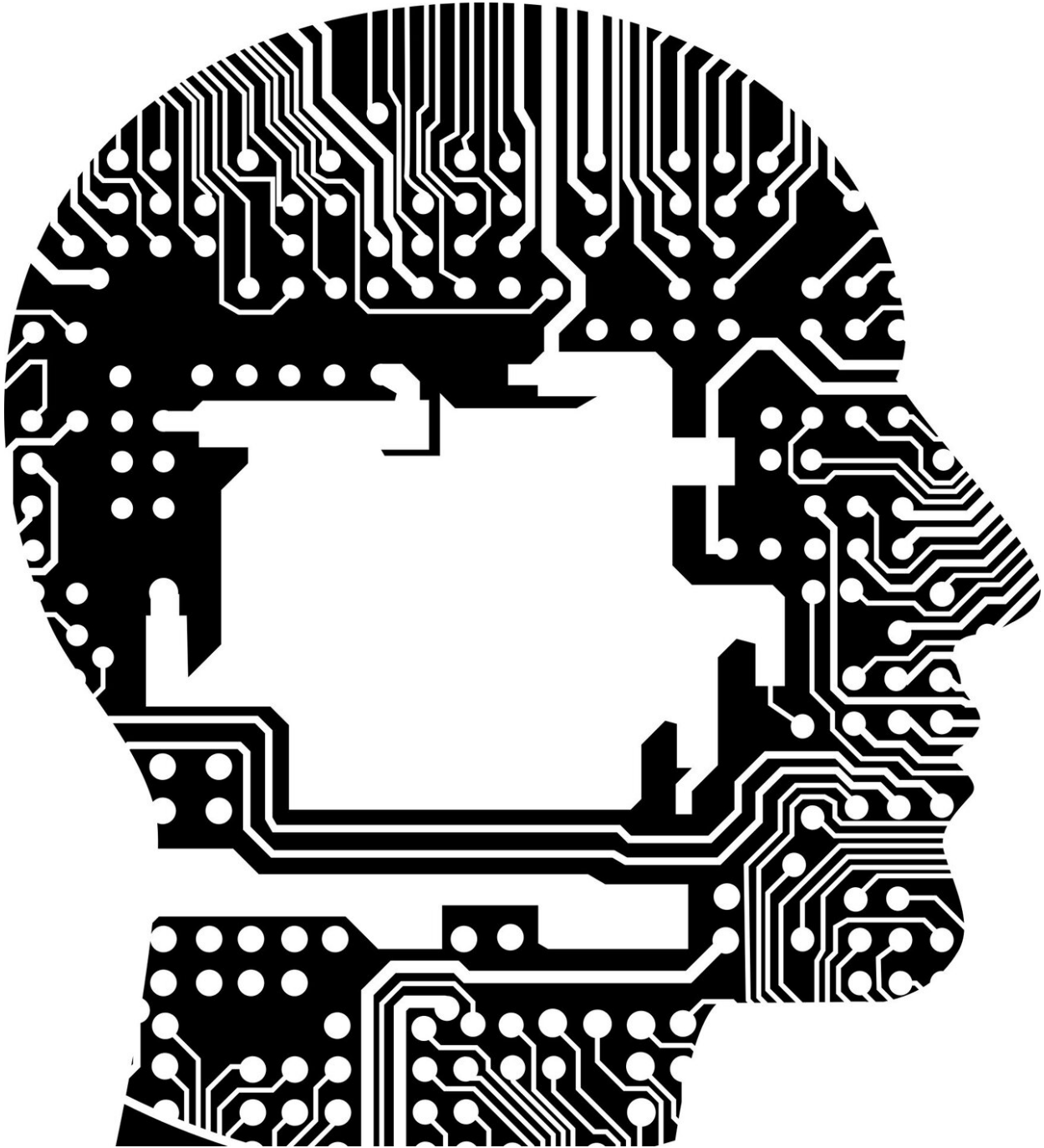


How AI and big data could save oil and gas companies from crises

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RUDN University economist and colleagues analyzed data from the

largest oil and gas companies in Russia during the economic crises of 2020 and 2022 and proposed an algorithm that would increase the sustainability of the industry. The key factor here is Industry 4.0 technologies—artificial intelligence, Internet of things, Big data and others. The results were published in *Resources Policy*.

In 2020, the pandemic crashed oil prices by almost 70% in the first three months of the year. In 2022, the oil and gas market faced a new crisis. However, contrary to expectations, world energy prices have increased, and this has had a [detrimental effect](#) on the oil and gas sector.

The RUDN University economist and his colleagues studied the performance of large oil and gas companies and came to the conclusion that the methods of the so-called fourth industrial revolution, or "Industry 4.0," will help them better survive the crisis. Modern methods of data collection and analysis will help bring order to corporate reporting and government control.

"Oil and gas companies aim not to create social and ecological advantage, but to issue attractive reports on sustainable development to improve their reputation in times of crisis. Therefore, recently the attention of researchers has been directed to imperfections in the corporate reporting of oil and gas companies," said Elena Popkova, Ph.D. in Economics, Professor at RUDN University, President of the Institute of Scientific Communications, President of the Consortium for Sustainable Development and Technological Leadership.

Economists conducted a study using the reports from two of the largest oil and gas companies in Russia: Lukoil and Gazprom. To do this, the authors used trend analysis method. Its essence is that each report position is compared with a number of the same positions in previous periods.

As a result, a so-called trend is determined—the main tendency of change. The focus of this study was Brent oil prices during two [economic crises](#)—2020 and 2022. The authors then compared the results obtained with [theoretical models](#) and formulated a methodology for sustainable development for oil and gas companies.

The algorithm proposed by RUDN University economists contains three key steps. The first is automated data collection. For this purpose, they proposed to use the Internet of Things and Big Data, which will allow generating and systematizing of extensive data sets. The second step is data analysis using artificial intelligence. Finally, the results obtained are summarized and comprehensive reports are generated—also with the help of [artificial intelligence](#).

"The breakthrough technologies of Industry 4.0 significantly increase resilience to crises in the oil sector. A management method based on data sets will automate corporate accounting and government monitoring. Sustainability reports can stimulate the sustainable growth of oil and [gas companies](#) by tracking their activities by the public and private sectors, and will also allow comparing the contribution of different companies to the [sustainable development](#) of the entire sector," said Elena Popkova, Ph.D. in Economics, Professor at RUDN University, President of the Institute of Scientific Communications, President of the Consortium for Sustainability and Technology Leadership.

More information: Elena G. Popkova et al, Environmentally sustainable policies in the petroleum sector through the lens of industry 4.0. Russians Lukoil and Gazprom: The COVID-19 crisis of 2020 vs sanctions crisis of 2022, *Resources Policy* (2023). [DOI: 10.1016/j.resourpol.2023.103733](#)

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