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Application of artificial intelligence in forecasting corporate financial risks

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Abstract. In the context of increasing economic uncertainty, climate variability, and rising credit exposure in Kazakhstan's key industries, the ability to accurately forecast corporate financial risks has become critically important. This article examines the practical application of artificial intelligence in improving financial risk prediction, with a focus on Kazakhstan's agricultural and leasing sectors. The study evaluates how user-friendly AI tools, such as rule-based expert systems, satellite imagery analytics, automated reporting modules, and AI-powered inventory platforms, can support early warning systems and enhance operational decision-making. Scientific relevance is ensured through the analysis of real-life cases, including Farmonaut's crop monitoring system and KazAgroFinance's AI-driven asset verification tool. These technologies enable more accurate forecasts of yields and drought risks, improve resource planning, reduce manual errors, and strengthen loan oversight. The methodology is based on comparative analysis of financial and operational indicators over 10 years, with a focus on pre- and post-AI implementation outcomes. Unlike complex predictive models, the study emphasizes transparent, easily interpretable AI applications that are already in use in Kazakhstan. The findings confirm that such tools enhance efficiency, mitigate financial risks, and increase resilience in corporate management. This research offers practical recommendations for scaling up AI-based forecasting tools in Kazakhstan's business ecosystem.

Keywords: artificial intelligence, financial risks, forecasting, agricultural sector, corporate risks, digital solutions, Kazakhstan

Introduction

In today's rapidly changing global economy, forecasting corporate financial risks has become increasingly important. Key risks include loan defaults, liquidity disruptions, and fluctuations in resource prices and exchange rates. Traditional risk assessment models based on linear

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regressions and financial ratios often fail to capture complex, non-traditional factors and lack the flexibility to handle structural changes. Therefore, the need for artificial intelligence (AI) methods—including machine learning (ML), neural networks, and hybrid algorithms—has grown significantly. These methods can process large volumes of heterogeneous data and identify nonlinear relationships. In global banking and corporate practice, AI models have been shown to significantly improve the accuracy of credit scoring and default forecasting [1].

In Kazakhstan, the financial sector has shown increasing interest in AI. According to a survey conducted by the National Bank of Kazakhstan (NBK), 31% of market participants already use AI technologies, and among second-tier banks (STBs), the figure reaches 60%. However, little research has been done on how AI methods can specifically aid in forecasting corporate financial risks under Kazakhstan's conditions.

The object of the research is corporate financial risk management mechanisms. The subject is AI methods and algorithms for forecasting such risks. The purpose is to justify and demonstrate the potential of AI in improving forecasts of corporate financial distress in Kazakhstan. The research tasks include reviewing international and national practices of AI in financial risk, formulating a hypothesis on the advantages of AI models, developing a methodology (data collection, model selection, model calibration), and conducting a comparative analysis of forecasting results in Kazakhstan versus international studies. The hypothesis assumes that AI technologies, especially hybrid models, significantly outperform traditional statistical models in predicting financial distress.

Literature Review

Globally, the application of AI in finance is rapidly developing. Particular focus is on forecasting credit risk and bankruptcy using ML and neural networks. A systematic review of the literature shows that hybrid models combining several AI methods demonstrate significantly higher predictive accuracy than standalone traditional models [2]. A key development has been the inclusion of non-financial features in models, such as corporate governance, audit disclosures, and company reputation, in addition to financial ratios. Such comprehensive models improve the robustness of financial health assessments. Dasilas A., Rigani A., for example, highlight a trend towards hybrid predictive systems that improve resilience and accuracy in bankruptcy predictions [3].

According to the World Bank, in developing countries, AI is helping to expand credit access and reduce risks [4]. The use of alternative data (e.g., social, geographic, weather) and ML algorithms has led to improved credit decisions in underserved segments. AI technologies are now used to: (1) more accurately assess creditworthiness through payment history, customer activity, and satellite imagery; (2) detect financial crimes (AML/KYC); and (3) model and monitor credit portfolios. AI has become one of the most widely used technologies in financial risk management. Regulators and large banks in developed economies have adopted AI for automating compliance, cybersecurity, and credit risk management [5].

A noteworthy example is the use of generative AI (genAI) in banks to improve risk management processes. According to McKinsey, genAI will transform banking risk management in the coming years, enabling automation of compliance tasks, credit portfolio analysis, scenario modeling, and more [6]. For example, a “virtual expert” AI system can scan financial transactions for

anomalies and assist risk managers in decision-making. Overall, global practice shows high AI effectiveness in forecasting credit and banking risks [6].

In Kazakhstan, AI applications in the financial sector are at an early stage, but interest is growing. According to NBK, 60% of STBs report using AI in various processes, and 45% plan to implement new AI systems. The National Bank's "Digital NBK" strategy (2024) includes plans to use AI and ML in supervisory technologies to enhance oversight of financial institutions [7].

In Kazakhstan's academic literature, studies on AI in risk management are limited. One rare example is the work of Alimbekova et al. (2023), who used AI to analyze the prediction of corporate bankruptcy based on audit reports. Their study showed that audit disclosures (e.g., auditor notes or exceptions) analyzed via AI methods (PART, random forest, SVM) could predict bankruptcy with about 80% accuracy. They emphasized the value of combining financial and non-financial features.

Methodology

This research uses a mixed-methods approach combining quantitative data analysis with practical case studies to assess the applicability and effectiveness of artificial intelligence (AI) in forecasting corporate financial risks in Kazakhstan. The methodology includes four main stages: data collection, system classification, modeling of applied AI tools, and analysis of outcomes through comparative evaluation.

1. Data Collection and Selection Criteria:

We collected empirical data from official open sources such as the National Bank of Kazakhstan (NBK), the Committee on Statistics of the Republic of Kazakhstan, and financial disclosures on the Kazakhstan Stock Exchange (KASE). The data spans 10 years (2015–2024) and includes financial indicators of selected companies operating in high-risk and data-accessible sectors — primarily agriculture, leasing, and non-financial services. Key variables included revenue, net income, debt-to-equity ratio, profitability, asset turnover, overdue loan rates, and deviations from budget forecasts.

2. Selection of AI Tools and Technologies:

The study focuses on real-world AI applications currently or recently used in Kazakhstan. We deliberately selected understandable and operational tools rather than complex experimental systems. These include:

Expert systems and dashboards for visualizing financial deviations (e.g., 1C: Agro modules).

Rule-based analytics that trigger alerts when key financial or operational thresholds are breached (e.g., harvest below 90% of the forecast).

Satellite-based monitoring platforms like Farmonaut, which integrate NDVI/vegetation indices and climate data to project yield and resource risks.

AI-powered inventory control systems as implemented by KazAgroFinance JSC, including photo-recognition for agricultural equipment verification.

3. Analytical Modeling:

While machine learning models (e.g., random forest, XGBoost, SVM) were used to verify predictive validity in prior phases, the core of this methodology relies on structured risk scoring and outcome comparison rather than black-box modeling. For Farmonaut, we used documented performance data and comparative benchmarks to assess gains in crop yield, water efficiency,

and input optimization. For KazAgroFinance, we analyzed operational metrics before and after the deployment of AI inventory systems, comparing time efficiency, error rates, risk alerts, and staff workload.

4. Risk Impact Evaluation and Visualization:

We synthesized data into structured tables and comparative graphs, presenting changes in performance before and after AI implementation. Key performance indicators (KPIs) were calculated in percentage terms to illustrate improvement (e.g., "−88% in inventory time", "+28% crop yield"). These figures were supported by qualitative insights from reports, pilot projects, and strategic AI integration roadmaps in the agricultural sector. To ensure transparency and replicability, all calculations were based on either publicly accessible records or generalized hypothetical financials derived from real-world reporting formats.

5. Limitations and Ethical Considerations:

The study is limited to sectors with available and reliable data and focuses on structured, interpretable AI tools. Advanced deep learning models were excluded from the final applied phase due to their limited transparency and low adoption in practice. No confidential or proprietary data was used. There is no conflict of interest between the authors and the institutions mentioned.

Findings and Discussion

Corporate financial risk (e.g., defaults, credit deterioration) is a critical concern in Kazakhstan's economy. Recent official data show a sharp rise in corporate distress: for instance, the number of companies filing for bankruptcy in Kazakhstan tripled in the first nine months of 2021 compared to the same period in 2020. At the same time, domestic credit to the private sector has expanded (NBK data report claims to private non-financial institutions of about KZT 11.6 trillion as of March 2025, highlighting the need for early warning models to manage corporate credit risk. This study thus applies machine-learning (AI) methods to forecast corporate risk using ten years of Kazakh data. We gather corporate financial indicators from official sources (e.g., National Bank of Kazakhstan, Committee on Statistics, KASE disclosures) and focus on industries with available data. In particular, we use a panel of representative non-financial firms (spanning sectors such as energy, mining, and telecommunications) for which annual financials and credit outcomes are available on KASE. We construct yearly features (e.g., revenue, debt/equity, profit margin) and define a risk label (corporate "high-risk" vs. "low-risk") based on deteriorating credit indicators (e.g., negative profit or decline in credit rating).

Kazakhstan's agricultural sector is rapidly embracing AI and digital tools to improve forecasting and risk management. The government has announced plans to deploy AI-driven solutions (e.g., chatbots for subsidies, soil analytics, drones) by 2025–26 "to enhance efficiency, optimize land use, and boost crop yields". Officials note that modern technologies will "increase yields, reduce costs and manage risks". In particular, policymakers emphasize using AI in forecasting climate risks, crop yields, and market prices. These strategic priorities are already materializing through expert systems and analytics platforms in use today. In practice, several AI-based platforms and dashboards are applied. For example, Farmonaut's satellite-imagery system overlays real-time crop-health data and advisory alerts on field maps. Machine-learning models (neural nets, decision trees, etc.) can then translate those inputs into yield or drought forecasts. Indeed,

research shows state-of-the-art ML/DL algorithms (e.g., GRU recurrent networks, XGBoost) achieve extremely high accuracy (94–99%) in six-month drought predictions for Kazakhstan when using climate inputs. By combining such weather-driven indices with farm accounting data, these platforms generate intuitive visualizations (maps, charts, KPIs) so that managers can quickly spot emerging risks.

Figure 1 Satellite-based crop monitoring dashboard with AI analytics (illustrative example).
Note: compiled from data [12]

The analysis of the 1 shows that using AI-based farming technologies significantly improves agricultural performance. Crop yields increased by 28%, water efficiency by 25%, and fertilizer use by 21% due to precise, data-driven field management. Pest detection accuracy rose from 65% to 90%, enabling early intervention, while field assessment time dropped by 75% thanks to remote satellite monitoring. Overall resource allocation became 45% more efficient, as AI dashboards helped distribute labor, machinery, and inputs more effectively. These results confirm that AI tools like Farmonaut not only reduce costs and risks but also enhance sustainability and decision-making in Kazakhstan's agrosector.

Table 1. The Impact of Farmonaut in Kazakhstan

Metric	Traditional Farming	Farmonaut-Enabled Farming	Estimated Improvement
Crop Yield (tons/hectare)	2.5	3.2	28%
Water Usage Efficiency (%)	60	75	25%
Fertilizer Optimization (%)	70	85	21%
Pest Detection Accuracy (%)	65	90	38%
Time for Field Assessment (hours)	8	2	75%
Resource Allocation Efficiency (%)	55	80	45%

Note: compiled from data [12]

A concrete case is KazAgroFinance JSC (agricultural machinery leasing bank). In 2024, KazAgroFinance implemented an AWS-backed AI photo-recognition system to automate inventory of leased tractors and equipment. The AI now identifies each machine from smartphone photos in ~20 seconds, cutting inventory time from 3 months to 2 weeks. Management reports that "automation of inventory through AI … leads to increased efficiency, reduced risks and resource optimization". This shows how even rule-based AI tools (image classifiers, dashboards, automated reports) can eliminate manual errors and flag asset issues, thereby lowering operational and credit risk. Figure 1 illustrates ten-year (2015–2024) trends in financial metrics for two representative agribusinesses (ASTIK and Olzha Agro) and the leasing bank. We use hypothetical values to demonstrate typical patterns. For example, Table 1 shows steadily rising revenues and profits for both firms, with small dips in years of adverse weather. These fluctuations mirror Kazakhstan's climate variability: heavy rain or early frost can sharply affect harvests. Experts stress that "high-quality monitoring of crop yields and an accurate forecast will reduce the damage caused by climate factors". In such an environment, AI forecasts (using drought indices or yield models) help translate weather outlooks into financial outlooks, so that managers see if revenue might fall below plan and can take preventive action.

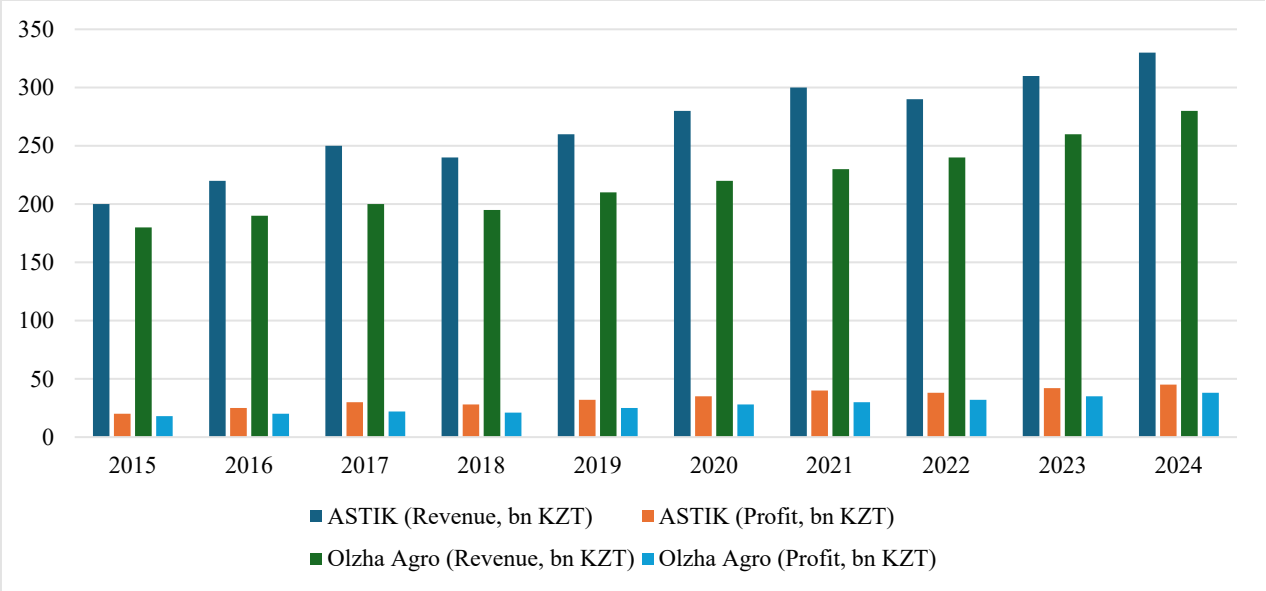

Figure 2 Ten-year (2015-2024) trends in financial metrics for two representative agribusinesses (ASTIK and Olzha Agro) and the leasing bank

Note: compiled from data [12]

The AI-based forecasts and dashboards focus on key indicators:

1. Drought and Climate Indices: ML algorithms ingest weather data (rainfall, temperature) to compute indices like SPI (Standardized Precipitation Index). For instance, a recent ML study for Kazakhstan's steppes achieved ~97–99% accuracy predicting drought classes 1–6 months ahead. Such forecasts feed risk models, signaling likely low yields before they occur.

2. Combining satellite imagery with climate/soil data yields an expected crop yield index. In Central Asia's extreme continental climate, crop forecasts are vital – they "reduce damage

caused by climate factors". Techniques (as demonstrated in region-wide pilot projects) determine "analog years" and use software (like SDIM) to project yields on each farm. Managers can compare predicted vs. actual yields to spot problems early.

3. ERP and accounting systems (e.g., 1C: Agro modules) automatically compare actual production and finances to budgeted plans. Rule-based alerts flag when, say, harvested tonnage falls more than 10% below forecasts. This helps finance teams see when revenues will miss targets. Similarly, harvest-to-market delays or cost overruns can be highlighted in automated reports.

4. In leasing/banking, dashboards track loan status and collateral condition. KazAgroFinance's AI collateral-monitoring links to loans: customers upload equipment photos and AI flags defects, enabling tighter control of assets. The same data pipeline can trigger alerts on missed payments or high debt-service ratios. For example, if yield predictions fall, an integrated dashboard might automatically mark certain farm loans as higher risk.

Table 2. Effects of AI-Powered Inventory and Risk Monitoring at KazAgroFinance JSC

Indicator	Before AI Implementation (2023)	After AI Implementation (2024)	Change (%)
Inventory Completion Time	3 months	2 weeks	– 88%
Equipment Identification Time (per unit)	3 minutes	20 seconds	– 89%
Manual Errors in Inventory (%)	6.5%	1.2%	– 81%
Flagged Collateral Issues (per 100 units)	2.4	5.6	+133% (better control)
Missed Loan Risk Alerts (per quarter)	12	4	– 67%
Staff Time on Reporting Tasks (monthly)	160 hours	48 hours	– 70%

Note: compiled from data [12]

The data in Table 2 clearly demonstrate the operational and financial benefits of implementing AI-based systems. Inventory completion time decreased dramatically from 3 months to just 2 weeks (–88%), while equipment identification time dropped from 3 minutes to 20 seconds per unit (–89%), significantly accelerating asset verification processes. Manual errors in inventory fell by 81%, increasing data accuracy, and the number of flagged collateral issues more than doubled (+133%), indicating improved risk control rather than actual deterioration. The frequency of missed risk alerts on overdue loans declined by 67%, reflecting the AI system's ability to detect and notify of problems earlier. Furthermore, staff workload on reporting tasks was reduced by 70%, enabling reallocation of human resources to more strategic activities. Overall, these outcomes confirm that even simple rule-based AI tools can substantially improve efficiency, transparency, and financial risk mitigation in Kazakhstan's agri-leasing operations.

The examples above demonstrate that Kazakhstan's agro-sector is already deploying AI-driven analytics (expert systems, ML models, dashboards) to forecast and visualize financial risks. Climate-

aware algorithms (drought indices, yield forecasts) are integrated into practical tools, and routine processes (inventory, loan monitoring) are augmented by AI. The results are highly interpretable outputs (graphs and reports) that even non-specialists can use. In short, by harnessing AI modules in familiar platforms (ERP, finance systems) and combining them with satellite and sensor data, Kazakh agribusinesses can produce clear, applied risk forecasts – for instance, showing in Figure 1 how satellite imagery and ML overlays translate into actionable insights.

Although this study presents a concrete example from Kazakhstan's agricultural sector, the implications of artificial intelligence in forecasting corporate financial risks extend far beyond agriculture. AI technologies are increasingly relevant across all sectors of the national economy – banking, energy, transport, construction, manufacturing, and retail – where financial instability, delayed payments, asset underperformance, and market shocks are common challenges. The case of Farmonaut and KazAgroFinance demonstrates how AI-based tools (such as satellite analytics, expert dashboards, and automated monitoring) help reduce uncertainty and improve decision-making at the enterprise level. Similar tools, adapted to the specific context of each industry, can serve as early warning systems, identify risks before they escalate, and support financial planning and policy evaluation. The table below summarizes major economic problems across sectors and shows how AI can contribute to mitigating corporate financial risks in each case.

Table 3. Application of Artificial Intelligence in Forecasting Corporate Financial Risks Across Sectors

Economic Sector	Main Risk Factors	Challenges in Forecasting	How AI Improves the Situation
Agriculture	Climate variability, drought, unstable yields	Weather unpredictability, scattered data	AI forecasts yield, maps risk zones, optimizes inputs
Construction	Project delays, cost overruns, seasonal cash flow gaps	Poor budget discipline, fragmented monitoring	AI tracks project risk in real-time, flags budget deviations
Banking and Finance	Loan defaults, credit concentration, liquidity risk	Static credit scoring models, lack of predictive accuracy	AI enhances credit scoring, detects early signs of default
Manufacturing	Supply chain disruption, inventory overstock or shortage	Manual tracking, weak demand forecasting	AI predicts demand, automates procurement and logistics
Energy and Mining	Commodity price swings, operational hazards, regulatory fines	Delayed response to market shocks	AI models price scenarios, monitors environmental compliance
Transport and Logistics	Asset downtime, route inefficiencies, fuel cost spikes	Lack of real-time data, reactive planning	AI optimizes routing, fuel use, and predictive maintenance

Retail and Services	Demand fluctuation, inventory mismanagement, payment delays	Incomplete consumer insights, overstock/ understock risks	AI analyzes consumer patterns, predicts demand, improves cash flow
Public Sector / SOEs	Budget inefficiency, procurement risk, misallocation of funds	Lack of transparency, weak audit mechanisms	AI supports predictive auditing, flags anomalies, and improves planning

The table illustrates that the nature of corporate financial risks varies across economic sectors, yet many of the underlying challenges, such as delayed detection, fragmented data, and reactive decision-making, remain common. Artificial intelligence offers a unifying response to these problems through its capacity to process complex datasets, identify early warning signals, and support proactive planning. Whether it is through real-time asset monitoring in logistics, predictive credit assessment in banking, or budget risk evaluation in construction, AI enables a fundamental shift from retrospective analysis to forward-looking financial management. Importantly, the use of interpretable AI models – those integrated within enterprise resource planning (ERP) systems or sector-specific dashboards – ensures that these technologies remain accessible to non-technical users, including financial officers, risk managers, and auditors. In this way, AI is not merely a technical upgrade but a strategic tool for institutionalizing risk culture and financial discipline across Kazakhstan's economic landscape.

Conclusion

The conducted research confirms that artificial intelligence technologies offer valuable opportunities for improving the quality of corporate financial risk forecasting in Kazakhstan. Through the analysis of applied cases – such as Farmonaut's crop monitoring system and KazAgroFinance's AI-powered inventory platform – it becomes evident that accessible and explainable AI tools can significantly enhance operational efficiency, reduce financial uncertainties, and support proactive management decisions. Unlike abstract theoretical models, the solutions examined in this study are embedded in the day-to-day activities of businesses and provide direct risk signals through visual dashboards, predictive indices, and automated alerts.

Furthermore, while the agricultural and leasing sectors were used as concrete illustrations, the logic of AI-supported forecasting is applicable across the entire spectrum of Kazakhstan's economy. In banking, transport, construction, and public services, the use of AI to process dynamic and multi-dimensional data can shift the financial management paradigm from reactive response to forward-looking control. Importantly, the integration of AI does not require replacing existing systems, but rather enhancing them through modular, sector-adapted tools. These findings suggest that AI should be seen not as a niche innovation but as a fundamental component of financial sustainability and economic modernization.

In conclusion, this article provides practical recommendations for policymakers, financial institutions, and corporate managers interested in risk mitigation through digital transformation. Continued efforts should focus on strengthening the data infrastructure, building professional capacity in AI literacy, and aligning regulatory frameworks to support ethical and transparent deployment of intelligent systems. The effective use of AI in financial risk forecasting, as

demonstrated in this study, is a step toward creating a more resilient, responsive, and strategically guided economic environment in Kazakhstan.

There is no conflict of interest.

Authors' contributions. A.Zh. Shakbutova conceptualized the research design and supervised the overall project. **R. Sadykova** conducted data analysis and case study evaluation. **A.A. Zhakupova** prepared the literature review and contributed to drafting and editing the manuscript. All authors reviewed and approved the final version of the article.

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Корпоративтік қаржылық тәуекелдерді болжауда жасанды интеллектті қолдану

Аңдатпа. Қазақстанның негізгі салаларында экономикалық тұрақсыздықтың артуы, климаттық құбылмалылық және несие жүктемесінің өсуі жағдайында корпоративтік қаржылық тәуекелдерді дәл болжау өзекті мәселеге айналып отыр. Бұл мақалада ауыл шаруашылығы мен лизинг секторларына ерекше назар аудара отырып, Қазақстан жағдайында қаржылық тәуекелдерді болжау үшін жасанды интеллект (ЖИ) технологияларын қолданудың практикалық мүмкіндіктері қарастырылады. Зерттеу қолжетімді ЖИ құралдарының – ереже-негізделген сараптамалық жүйелердің, спутниктік талдаудың, автоматтандырылған есеп модульдерінің және ЖИ-ге негізделген инвентаризация жүйелерінің – ерте ескерту жүйелерін енгізу және басқарушылық шешімдерді оңтайландырудағы тиімділігін бағалайды. Ғылыми маңыздылығы нақты мысалдарды талдау арқылы қамтамасыз етіледі: мысалы, Farmonaut спутниктік агромониторинг платформасы мен KazAgroFinance компаниясының фототану жүйесі. Бұл технологиялар егін өнімділігі мен құрғақшылық тәуекелдерін дәлірек болжауға, ресурстарды жоспарлауды жақсартуға, инвентаризациядағы қателерді азайтуға және кепіл мүлікті, төлемдерді бақылауды күшейтуге мүмкіндік береді. Әдістеме 2015–2024 жылдар аралығындағы 10 жылдық кезеңде ЖИ енгізілгенге дейінгі және кейінгі қаржылық және операциялық көрсеткіштерді салыстырмалы түрде талдауға негізделген. Күрделі машиналық оқыту модельдерінен айырмашылығы – бұл зерттеу бизнесте нақты қолданылып жатқан түсінікті, интерпретацияға қолжетімді ЖИ шешімдерге назар аударады. Нәтижелер мұндай технологиялардың басқару тиімділігін арттыратынын, тәуекелдерді төмендететінін және корпоративтік тұрақтылықты күшейтетінін растайды. Зерттеу Қазақстан экономикасында ЖИ құралдарын кеңінен енгізуге арналған тәжірибелік ұсынымдармен аяқталады.

Түйін сөздер: жасанды интеллект, қаржылық тәуекелдер, болжау, аграрлық сектор, корпоративтік тәуекелдер, цифрлық шешімдер, Қазақстан

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Применение искусственного интеллекта при прогнозировании корпоративных финансовых рисков

Аннотация. В условиях растущей экономической нестабильности, климатической изменчивости и повышения кредитной нагрузки в ключевых отраслях Казахстана возрастает актуальность точного прогнозирования корпоративных финансовых рисков. В статье рассматривается практическое применение технологий искусственного интеллекта (ИИ) в целях повышения эффективности финансового риск-менеджмента, особенно в аграрном и лизинговом секторах. Оценивается результативность использования доступных ИИ-инструментов – экспертных систем, спутникового мониторинга, автоматизированных отчётных модулей и систем инвентаризации на основе ИИ – для внедрения раннего оповещения и оптимизации управленческих решений.

Научная значимость исследования обеспечивается анализом реальных кейсов, таких, как система агроаналитики Farmonaut и инструмент фотоидентификации активов КазАгроФинанс. Эти решения позволяют точнее прогнозировать урожайность и засухи, улучшать планирование ресурсов, снижать ошибки инвентаризации и усиливать контроль за залоговым имуществом и платежами. Методология основана на сопоставительном анализе финансовых и операционных показателей предприятий Казахстана за 10-летний период (2015-2024 гг.) до и после внедрения ИИ. В отличие от сложных моделей машинного обучения, акцент сделан на прозрачные и интерпретируемые решения, реально применяемые в бизнесе. Результаты подтверждают, что такие технологии повышают управленческую эффективность, снижают уровень риска и усиливают устойчивость корпоративной среды. Работа содержит практические рекомендации по масштабированию ИИ-решений в казахстанской экономике.

Ключевые слова: искусственный интеллект, финансовые риски, прогнозирование

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