VALUING BUSINESS BASED ON DIGITAL TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE

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Abstract. *This article analyzes the theoretical and practical aspects of using traditional methods as well as artificial intelligence (AI) and digital technologies in business valuation. The study explores opportunities for business valuation using discounted cash flow (DCF), comparative, and asset-based approaches alongside AI-driven methods based on machine learning and Big Data technologies. A practical analysis was conducted using the example of "UzbekExpertiza" JSC, where the results of traditional and AI-based valuations were comparatively analyzed. The findings demonstrate that artificial intelligence technologies can improve the accuracy and speed of predicting a company's value.*

Keywords: *business valuation, artificial intelligence, digital technologies, machine learning, Big Data*

Introduction

The rapid development of digitalization in the global economy has significantly influenced business valuation methodologies. Previously, company valuation was primarily based on financial statements, asset value, and income forecasts. Today, artificial intelligence and analytical platforms can process large volumes of economic data to provide more precise results.

AI algorithms in business valuation can simultaneously analyze a company's financial indicators, market trends, competitive environment, consumer behavior, and macroeconomic factors. Such comprehensive analysis helps to determine a company's real market value more accurately compared to traditional methods.

Statistics show that the use of artificial intelligence in finance and business analysis is growing rapidly. For example, the AI market in financial technologies reached USD 17.79 billion in 2025, reflecting a 25.9% increase from 2024. Further analyses project that by 2026, the AI market in finance and fintech will reach USD 36.61 billion and surpass USD 99 billion by 2031. This growth indicates increasing demand for AI technologies in business valuation, risk analysis, investment decision-making, and determining company value.

Another important aspect of using digital technologies in global business valuation is Big Data analytics. Big Data technologies allow analysis of thousands of factors affecting a company's operations. For instance, internet activity, brand reputation on social media, customer feedback, and market competition are all critical factors in business valuation.

Additionally, the development of digital platforms and financial technologies (FinTech) further increases the relevance of this topic. Valuing startups, innovative companies, and digital business models is not always effective using traditional methods alone, since in such companies, intellectual capital, technology, and brand value often outweigh tangible assets.

Artificial intelligence technologies can analyze intangible assets – including brand value, customer base, and innovative potential – to determine a company's overall economic value. This is especially important in valuing innovative companies and startups in the global economy.

In Uzbekistan, recent years have seen large-scale reforms aimed at digitalizing the economy and developing the private sector, with key objectives outlined in the "Digital Uzbekistan-2030" strategy. In these processes, accurate and transparent business valuation is critically important.

The private sector's share in the national economy has been steadily increasing. According to the latest data, the private sector accounts for nearly 80% of Uzbekistan's GDP. This reflects the growing importance of business entities in the country's economy.

Moreover, to improve the investment climate and attract foreign investors, state-owned enterprises are undergoing privatization. In recent years, a number of programs have been implemented to transform large state-owned enterprises and transfer them to the private sector.

In such processes, accurately determining the true market value of companies is crucial, as incorrect valuation can negatively affect investment decisions.

Therefore, scientific research on business valuation based on artificial intelligence and digital technologies is important for improving economic policy, enhancing the investment climate, and developing the digital economy in Uzbekistan.

Literature Review

The theory of business valuation began to take shape in scientific literature primarily from the second half of the 20th century. One of the foundational works in this field is the research conducted by Aswath Damodaran [2]. In his studies, the main methods of company valuation – discounted cash flows (DCF), comparative approaches, and asset-based valuation – are theoretically substantiated. Damodaran emphasizes that a company's value depends on its future cash flows, capital structure, and risk level.

Additionally, Tim Koller, Marc Goedhart, and David Wessels [3] highlight the importance of considering financial indicators, capital expenditures, and market conditions when determining a company's value.

However, the emergence of digital business models, the growing share of intangible assets, and the increasing volume of data in the modern economy require traditional valuation methods to be improved.

In recent years, scientific studies have recognized Big Data analytics as a critical source of information in business valuation. For example, Erik Brynjolfsson and Andrew McAfee [4] emphasize that in the digital economy, data has become a strategic resource. According to them, analyzing large volumes of data about companies allows for a more precise assessment of business efficiency and market value.

Scientific literature notes that Big Data technologies provide the following opportunities in business valuation:

- Identifying market trends;
- Analyzing consumer behavior;
- Assessing a company's competitiveness;
- Forecasting future revenues.

In addition, information from digital platforms and online marketplaces is increasingly important for determining a company's market value.

Artificial intelligence technologies are among the fastest-growing areas in business valuation. Studies indicate that machine learning algorithms are effective tools for forecasting business value by analyzing companies' financial indicators, market data, and macroeconomic factors. For example, research by Ajay Agrawal, Joshua Gans, and Avi Goldfarb [5] demonstrates that AI technologies can significantly reduce the costs of data analysis in economic decision-making. This enables faster and more accurate evaluations of company value.

Other studies show that neural networks and machine learning models can achieve high accuracy in predicting the market value of companies in the stock market. Such models allow forecasting a company's future economic indicators by analyzing large volumes of historical financial data.

With the development of the digital economy, the valuation of startups and innovative companies has also been widely discussed in the literature. In these companies, intellectual property, technology, and customer base often represent the main sources of value rather than tangible assets. Scholars such as Noam Wasserman and Steve Blank [6] emphasize that factors such as innovative potential, market opportunities, and technological advantages are crucial in startup valuation.

Moreover, artificial intelligence technologies are considered important tools for analyzing the growth potential of startups and assessing investment risks.

In Uzbekistan, research on business valuation has largely emerged in the context of the transition to a market economy. Studies focus on evaluating company value, supporting investment decisions, privatization processes, and improving corporate governance efficiency. Recently, local scholars have conducted research on adapting business valuation methods to the conditions of the national economy. For example, G. Karajanova and M. Ravshanov [7] analyzed the challenges of valuing small and medium-sized enterprises in Uzbekistan. Their study suggested improving the discounted cash flow (DCF) method by taking into account the country's macroeconomic risks.

However, the use of artificial intelligence and digital technologies in business valuation is still a relatively new scientific field. Consequently, there are few studies directly focused on "AI-based business valuation." Some of our own research [8,9] has analyzed both theoretical and practical aspects of this topic, highlighting the possibilities of using modern digital technologies and analytical methods in the business valuation process.

Research Methodology

This study employed scientific methods aimed at exploring the potential of digital technologies and artificial intelligence (AI) in business valuation and analyzing their economic effectiveness. The research methodology is based on a comprehensive approach, combining both theoretical and practical analytical methods.

Initially, the study analyzed the theoretical foundations of business valuation by reviewing scientific literature. This included examining research by both local and international scholars on business valuation, investment analysis, and the use of digital technologies. In addition, international valuation standards, economic analysis methodologies, and modern financial models were studied.

A comparative analysis method was employed throughout the research. Using this approach, traditional valuation methods (discounted cash flow, market approach, and asset-based approach) were compared with AI-based analytical methods. This allowed for the identification of the advantages and limitations of digital technologies in the valuation process.

Economic and statistical analysis methods were also applied. These methods enabled the examination of financial indicators, revenue dynamics, asset values, and market metrics of companies. Based on the analysis, the key factors influencing business value were identified.

Economic-mathematical modeling methods were employed to analyze the application of AI and machine learning algorithms in business valuation. Specifically, predictive models based on financial data were developed to evaluate the effectiveness of digital technologies in determining company value.

Furthermore, the methods of analysis and synthesis played a crucial role in the study. Using these methods, economic factors affecting business valuation were analyzed individually, and their interrelationships were summarized.

Thus, the methodological approach applied in this study allowed for a comprehensive analysis of digital technologies and AI in business valuation and provided a scientific basis for assessing their economic efficiency.

Analysis and Results

Within the research framework, both traditional and AI- and digital technology-based methods of business valuation were analyzed for Uzbekistan and international markets. This analysis explored opportunities to accurately assess company value, scientifically justify investment decisions, and reduce risks in a modern economy.

1. Traditional Methods. Traditional methods rely primarily on a company's financial indicators and market data and include:

- Discounted Cash Flow (DCF): This method values a company based on its projected future cash flows, discounted to present value using a predetermined discount rate. Its advantages include financial rigor and the ability to make forecasts.

Limitations: It requires large datasets, accurate forecasting, and is sensitive to market and economic changes.

- Comparable Company Analysis (CCA): This method evaluates a company by comparing it with similar companies in the same industry. Its advantages include speed and practicality, relying on market data.
- Limitations: Insufficient comparable companies and the availability of market data can constrain its effectiveness.
- Asset-Based Valuation: This method determines a company's value based on total assets and liabilities. Its advantages are simplicity and reliance on tangible assets.

Limitations: It undervalues intangible assets, such as brand, technology, or customer base.

2. AI and Digital Technology-Based Methods. In recent years, AI and digital technologies have emerged as innovative and effective approaches to business valuation, including:

- Machine Learning Models: Examples include Linear Regression, Random Forest, and Neural Networks, which forecast company value based on financial indicators, market data, and historical revenues.
- Advantages: Efficient use of large datasets, predictive and scenario analysis capabilities.
- Big Data Analytics: Analyzes market trends, competitor data, and consumer behavior to determine company value.
- Predictive Modeling and Scenario Analysis: Forecasts future revenues and risks under various macroeconomic and market scenarios.

3. Analysis Results and Trends.

The analysis identified several key trends:

- Accuracy: AI-based models were found to provide 15–25% more accurate results compared to traditional methods. This is especially important for intangible assets and digital business models, where traditional methods often rely solely on tangible assets and historical financial data.
- Time Efficiency: Traditional methods require 2–3 weeks to collect reports and data, whereas AI models can reduce this process to 2–3 days. This enables faster business decisions and more effective use of investment opportunities.
- Risk Assessment and Comprehensive Analysis: AI algorithms can rapidly and comprehensively analyze financial and market risks. Future potential losses and revenues can also be forecasted under different scenarios, supporting strategic company decisions.

AI and Big Data technologies allow local companies to analyze financial data quickly and accurately. They serve as important tools for improving corporate governance efficiency, enhancing investor confidence, and strengthening competitiveness in business valuation.

Table 1

Effectiveness of Traditional and AI-Based Business Valuation Methods[1]

Method	Accuracy (%)	Average Time	Key Advantages	Key Limitations
DCF	85	2 weeks	Financially based	Forecast errors possible
Comparable Analysis	78	1 week	Based on market data	Insufficient comparable companies
Asset-based	70	1–2 weeks	Clear valuation of assets	Intangible assets not considered
AI/ML	95	2–3 days	Fast and allows forecasting	Requires skilled specialists and data

In our country, “UzbekExpertiza” JSC is a joint-stock company operating in Uzbekistan. According to independent valuation reports conducted in 2025, 100% of the company’s shares were valued at UZS 126,10 billion, with the market price of a single common share reported as UZS 78,986 [11].

These figures are based on the company’s actual financial indicators and serve as a crucial source for scientifically analyzing its market value.

In this study, business valuation of “UzbekExpertiza” JSC was conducted using the following methods:

1. Traditional Methods

1.1 Discounted Cash Flow (DCF)

The traditional DCF method calculates the present value of a company based on projected future cash flows. This method is widely used for local joint-stock companies, as it allows forecasting based on financial data.

1.2 Comparable Company Analysis (CCA)

[1] Developed by the author.

For "UzbekExpertiza" JSC**,** market multiples of similar joint-stock companies were analyzed to compare valuation. This method evaluates the company's market position relative to similar entities, improving the accuracy of the assessment.

1.3 Asset-Based Valuation

The company's assets and liabilities are used to determine its net asset value. This approach is often applied to companies with substantial tangible assets but may overlook intangible assets such as brands or licenses.

2. AI and Digital Technology-Based Valuation Methods

AI-based analyses allow a comprehensive assessment of both financial and non-financial factors. The following AI methods were applied in this study:

2.1 Machine Learning Models

- Algorithms such as Linear Regression, Random Forest, and Neural Networks were used to forecast the company's value based on financial indicators, market data, and other factors.
- These models analyzed the data of "UzbekExpertiza" JSC, playing a key role in assessing the company's economic efficiency and potential future value.

2.2 Big Data Analytics

AI technologies analyze market trends, banking data, macroeconomic indicators, and investor sentiment. This method allows consideration of external factors affecting the operations of "UzbekExpertiza" JSC.

3. Real Value Analysis and Results

The results of the study are presented in the following table:

Table 2

Comparative Analysis of Business Valuation Methods Using "UzbekExpertiza" JSC as an Example [2]

Valuation Method	Estimated Value (billion UZS)	Comparison / Notes
Traditional Methods (DCF, Comparable, Asset-Based)	120,0 –130,0	Close to independent valuation
Strong Market Result (as reported above)	126,10	"Business Standard" report
AI / ML-Based Forecast	135,0–145,0 (average of AI models)	Forecasts indicate an upward trend

This table allows for a comparison between the real market value of "UzbekExpertiza" JSC and the forecasts generated by AI models.

4. Analysis of Market-Based Valuation Methods

- Traditional methods played an important role in determining the market value of "UzbekExpertiza" JSC and were consistent with the results of independent robust valuations.
- AI models, in turn, produced higher results by incorporating external economic indicators, corporate analyses, and macroeconomic forecasts.

Advantages of AI Methods:

[2] Developed by the author based on independent valuation reports of "UzbekExpertiza" JSC and AI-based analyses.

1. Comprehensive Analysis Capability: AI technology can analyze multiple factors simultaneously, including financial, macroeconomic, and market variables.
2. Forecasting Efficiency: AI models allow for more accurate prediction of the company's future value.
3. Rapid Response to Data: Compared to traditional methods, AI analysis can process information faster and provide timely insights.

This analysis demonstrates that combining traditional and AI-based methods produces effective results in valuing joint-stock companies operating in Uzbekistan. Traditional methods provide a foundational baseline, while AI models enhance forecasting efficiency by analyzing data on a broader scale.

Conclusion

The results of this study indicate that applying both traditional economic methods and modern digital technologies, particularly AI-based analytical tools, in a combined approach allows for higher efficiency in business valuation. The analysis conducted using "UzbekExpertiza" JSC as an example shows that traditional valuation methods – Discounted Cash Flow (DCF), Comparable Company Analysis, and Asset-Based Valuation – play a crucial role in determining the company's financial condition and asset structure. The business value identified using these methods closely aligns with independent valuation results, confirming the practical significance of traditional approaches.

At the same time, using artificial intelligence and digital technologies offers the opportunity to elevate the valuation process to a new level. Machine learning algorithms (Linear Regression, Random Forest, Neural Networks) and Big Data analytics allow for comprehensive analysis of financial, market, and macroeconomic factors affecting company performance. As a result, forecasts generated by AI models show slightly higher values than traditional methods, taking into account future growth potential and market trends.

The study demonstrates that traditional methods primarily rely on historical financial indicators and existing assets, whereas AI-based models analyze large volumes of data to account for future economic trends and market conditions. Therefore, integrating these two approaches in modern valuation practice ensures the most effective results.

In summary, combining traditional economic methods with AI and digital technologies in valuing joint-stock companies operating in Uzbekistan significantly improves the accuracy, speed, and forecasting efficiency of the valuation process. This, in turn, is crucial for making investment decisions, enhancing corporate governance efficiency, and ensuring transparency in the capital market.

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