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Strategic Management of the Digital Transformation of the Construction Industry in the Context of Integrated Interaction Between the Real Estate Market and Financial Leasing Mechanisms Under Conditions of Economic Digitalization

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Keywords digital transformation, construction industry, strategic management, real estate market, financial leasing, BIM, artificial intelligence, Internet of Things, digital platforms, investment efficiency

Abstract

The article provides a comprehensive scientific analysis of strategic management in the construction sector under conditions of large-scale digital transformation, with particular emphasis on the systemic interrelation between the real estate market and financial leasing mechanisms. The study substantiates that digitalization fundamentally reshapes managerial paradigms in construction by integrating digital platforms, advanced data analytics, and innovative financing instruments into a unified strategic framework. The research formulates strategic directions for the digital development of the construction sector, identifies structural and institutional barriers to digital transformation, and visualizes the impact of digital technologies on key investment and operational indicators. A conceptual mechanism of interaction between construction enterprises, real estate market participants, and financial leasing institutions is developed, demonstrating how digital tools reduce investment barriers, enhance transparency, and accelerate project implementation cycles. The methodological framework is based on a dialectical approach, systems analysis, economic and statistical methods, comparative analysis, and a structural-functional approach. The results confirm that the implementation of Building Information Modeling (BIM), digital platforms, smart contracts, artificial intelligence, and Internet of Things technologies significantly improves the efficiency of financial leasing operations, enhances coordination among stakeholders, and strengthens the quality of strategic decision-making. The practical significance of the study lies in its contribution to the formation of an integrated strategic management model that supports sustainable development, increases investment attractiveness, and improves housing accessibility in the digital economy.

JEL Classification: A10, A11, A19, E22, G11, G17, G19, O10, O30, O40

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1. Introduction

In the contemporary economic environment, strategic management in the construction sector can no longer be effectively implemented without a systematic consideration of digitalization processes that permeate all stages of investment and construction project realization—from conceptual design and financial planning to construction execution and post-commissioning operation. Digital transformation acts as a catalyst for profound structural changes in construction, reshaping business models, managerial tools, and interaction mechanisms among market participants.

Under conditions of accelerated digital transformation of the economy, the development of the real estate market acquires particular strategic importance, as it directly influences macroeconomic stability, investment flows, employment dynamics, and social welfare. The construction sector, as a backbone of real estate development, is increasingly dependent on advanced digital solutions that ensure transparency, efficiency, and adaptability to volatile market conditions.

The growing complexity of construction and infrastructure projects, coupled with heightened requirements for capital efficiency and risk management, necessitates the modernization of financial instruments used to support real estate development. In this context, financial leasing emerges as a strategically important mechanism for mobilizing investment resources and improving access to real estate assets for both corporate and individual market participants. When combined with digital technologies—such as BIM, smart contracts, and integrated digital platforms—financial leasing becomes not only a financing tool but also an element of a broader digital ecosystem (Najafov, 2025).

Despite the rapid diffusion of digital technologies globally, domestic management practice still demonstrates a fragmented and often inconsistent integration of digital solutions into strategic management frameworks for construction, real estate, and financial leasing. This fragmentation limits the innovative potential of the construction sector and underscores the need for scientifically grounded strategic approaches that ensure coordinated digital transformation across interconnected markets.

2. Literature Review

The interaction between strategic management, digital transformation, real estate markets, and financial leasing has been widely addressed in contemporary academic literature, though often in a fragmented manner. Scholars emphasize that digital transformation converts the real estate sector into a complex digital ecosystem characterized by data-driven decision-making, automation, and platform-based interactions (Sittler, 2017). Technologies such as BIM, IoT, and big data analytics enable real-time monitoring, predictive maintenance, and enhanced lifecycle management of construction projects.

Recent studies highlight that digitalization significantly improves operational efficiency and managerial quality in real estate markets by enhancing information availability, reducing transaction costs, and improving customer experience (Özdilek, 2024). Moreover, strategic management plays a decisive role in enabling organizations to adapt to rapid technological change, coordinate stakeholder interests, and respond flexibly to shifting market demand (David et al., 2021).

However, despite these contributions, existing research rarely offers an integrated analytical framework that simultaneously considers strategic management, digitalization, real estate market dynamics, and financial leasing mechanisms. In particular, insufficient attention is paid to the role of digital platforms in synchronizing financial leasing operations with construction proje[-[;;?ct management and real estate market demand. This research gap necessitates further in-depth investigation.

3. Aim and Objectives of the Study

The aim of this article is to investigate and substantiate the role of strategic management based on the digitalization of the construction sector, taking into account the systemic interrelation between the real estate market and financial leasing mechanisms.

To achieve this aim, the study pursues the following objectives:

- to conceptualize the mechanisms of interaction between construction, real estate, and financial leasing under digital transformation;
- to assess the impact of digital technologies on strategic management efficiency;
- to identify key challenges and institutional barriers to digital integration;
- to formulate strategic directions for sustainable digital development of the construction sector.

4. Methodology

The methodological framework of the study is grounded in an interdisciplinary approach that combines general scientific and specialized research methods. The dialectical method is applied to analyze the interdependence and dynamic evolution of construction, real estate, and financial leasing systems. Systems analysis is employed to identify structural relationships among market participants under digitalization. Comparative analysis allows for the evaluation of alternative strategic approaches, while economic and statistical methods support the assessment of trends and performance indicators. The structural-functional approach is used to determine the roles and functions of digital tools within the strategic management system (Najafov, 2025).

5. Results and Discussion

Strategic management in the digitalized construction sector requires an integrated vision that aligns construction processes, real estate market dynamics, and financial leasing mechanisms within a unified digital environment. The conceptualization of interaction mechanisms within the "construction–real estate–financial leasing" system demonstrates that digital platforms serve as central coordination hubs, enabling data exchange, transparency, and synchronization of strategic decisions.

Financial leasing provides flexible and adaptive financing solutions that enhance real estate accessibility for businesses and households. The integration of digital tools into leasing operations significantly streamlines approval processes, reduces transaction costs, and mitigates information asymmetry. Digital platforms facilitate real-time communication among developers, investors, lessors, and regulators, thereby increasing operational efficiency and trust.

Advanced technologies such as artificial intelligence, IoT, and management information systems enhance predictive analytics, optimize risk assessment, and support evidence-based strategic planning. At the same time, digitalization introduces new challenges, including cybersecurity risks, regulatory uncertainty, system interoperability issues, and uneven digital literacy among market participants (Aliyev, 2025).

Overall, digital transformation strengthens the resilience and competitiveness of the construction sector, aligns supply with real estate market demand, and expands the functional capacity of financial leasing as a strategic investment instrument.

The study confirms that strategic management based on digitalization is a critical prerequisite for the sustainable development of the construction sector in the modern digital economy. The integration of digital technologies with financial leasing mechanisms and real estate market processes forms a synergistic system that enhances investment efficiency, transparency, and adaptability. The proposed strategic framework contributes to improved housing accessibility, increased investment inflows, and accelerated implementation of construction projects. Future research should focus on empirical validation of digital leasing platforms and the development of regulatory models that support balanced digital growth.

Digitalization of the Construction Sector in Ukraine: Current State, Strategic Directions, and Implications for Financial Leasing and Real Estate Markets

The current state and challenges of digitalization in the construction sector in Ukraine are shaped by a complex interaction of technological, institutional, financial, and regulatory factors. Despite the growing global adoption of digital construction technologies, the Ukrainian construction industry continues to face structural barriers that constrain the pace and effectiveness of digital transformation. These barriers are particularly evident in the implementation of Building Information Modeling (BIM), the use of integrated digital platforms, the alignment of

digital tools with financial leasing mechanisms, and the availability of transparent and structured online real estate market data (Denysenko, Breus, & Prytula, 2024; Breus & Balymov, 2024; Denysenko, Breus, & Balymov, 2024; Breus & Denysenko, 2023; Denysenko & Breus, 2021, 2023).

Key Dimensions of Digitalization Challenges

First, the level of BIM implementation in Ukraine remains limited. Although BIM is widely recognized as a cornerstone of digital construction, its diffusion is constrained by high initial implementation costs, insufficient digital infrastructure, and a persistent shortage of qualified personnel capable of operating advanced modeling systems. These limitations reduce the capacity of construction firms to exploit the full potential of BIM-enabled lifecycle management and cost optimization (Denysenko & Breus, 2023).

Second, the use of digital platforms within the construction and real estate sectors is characterized by fragmentation. Existing systems often operate in isolation, lacking interoperability and integration into a unified digital ecosystem. This fragmentation impedes data exchange, slows transaction processes, and undermines transparency across project stakeholders, including developers, investors, contractors, and end users (Breus & Balymov, 2024).

Third, integration with financial leasing instruments remains underdeveloped. Legal inconsistencies, regulatory gaps, and limited access to long-term financing restrict the effective coupling of digital construction processes with leasing mechanisms. As a result, digital innovations fail to fully translate into improved affordability and investment accessibility in the housing market (Denysenko, Breus, & Balymov, 2024).

Finally, online access to the real estate market is constrained by limited analytical tools and unstructured property listings. The absence of standardized digital data reduces market transparency and prevents accurate price forecasting and demand analysis, which are essential for evidence-based investment and policy decisions (Breus & Denysenko, 2023).

Digital Technologies as Drivers of Efficiency and Market Transformation

Digitalization introduces advanced technologies such as Building Information Modeling (BIM), artificial intelligence (AI), and the Internet of Things (IoT), which collectively enhance construction project management, operational efficiency, and decision-making accuracy. BIM, in particular, enables integrated project visualization, coordination, and lifecycle optimization, while AI-driven analytics improve forecasting accuracy and risk assessment (Wang, 2024).

However, the successful adoption of these technologies requires a strategic and systemic approach to digital transformation. This involves not only technological investment but also organizational change management, workforce reskilling, and the redesign of institutional processes. Without comprehensive change management frameworks, digital initiatives risk remaining fragmented and underutilized within construction firms (Nikmehr, Hosseini, Martek, Zavadskas, & Antucheviciene, 2021).

Strategic Directions of Digital Development

Based on an integrated analysis of the core manifestations of digitalization challenges in the Ukrainian construction sector, several strategic directions of digital development can be identified (Table 1).

Table 1. Strategic Directions of Digital Development in the Construction Sector

Direction	Expected Results	Digital Solutions
Integration of financial leasing	Increased investment accessibility	Electronic leasing platforms, smart contracts
Platformization of interaction	Transparency and speed of transactions	Digital marketplaces for construction and real estate assets
Digital transformation of the market	Price predictability, demand forecasting	Big Data and AI-based market analytics
Electronic certification of properties	Enhanced trust and transparency	Blockchain-based property rights registration

Source: systematized by the authors

These strategic directions emphasize the convergence of digital technologies with financial instruments and market infrastructure, enabling more efficient capital allocation and reducing transaction costs.

Impact on Real Estate Markets and Financial Leasing

The integration of digital tools exerts a significant influence on the real estate market by increasing construction accuracy, reducing delays, and improving cost control. These effects contribute to the expansion of housing supply and enhance affordability, particularly when combined with financial leasing agreements that lower entry barriers for households (Denysenko, Breus, Levchenko, Prytula, & Balymov, 2024).

Digitalization also facilitates the emergence of smart construction platforms, which optimize resource allocation, streamline project delivery, and enable rapid responses to changes in market demand. Through real-time data processing and predictive analytics, these platforms support more efficient coordination between developers, financiers, and end users (Wang, 2024).

Financial leasing plays a critical role in improving access to housing, and digitalization enhances the management of leasing processes by increasing transparency, reducing administrative costs, and minimizing information asymmetries. Digital leasing platforms enable more efficient contract management and risk monitoring, strengthening trust between lessors and lessees (Denysenko et al., 2024).

Moreover, the interconnection between digitalization and financial leasing increases the investment attractiveness of real estate projects. Streamlined digital workflows reduce development risks, shorten project cycles, and lower transaction costs, thereby improving expected returns for investors (Kaya & Dikmen, 2024).

BIM as a Catalyst for Financial and Operational Efficiency

The integration of BIM within digitally enabled construction projects has a profound impact on project management, particularly in the context of financial leasing. Key advantages include:

1. Improved financial planning and cost estimation accuracy. BIM supports precise cost calculations through 5D modeling, which integrates time and cost dimensions. This allows project managers to forecast expenses more accurately and align financial planning with leasing requirements (Musonda, 2019).
2. Enhanced risk management efficiency. BIM strengthens proactive risk mitigation across the entire project lifecycle. By integrating traditional risk management approaches with advanced modeling techniques, BIM enables early identification and mitigation of technical, financial, and operational risks, thereby improving project reliability and investor confidence (Abosaq & Batool, 2024).
3. Improved coordination and stakeholder communication. BIM enhances cross-disciplinary collaboration and stakeholder communication, reducing coordination failures that frequently generate risks in construction projects. Improved information sharing supports more effective decision-making and contract management (Abdelalim & Elnaggar, 2024).
4. Resource optimization and sustainability gains. Through improved resource allocation, waste reduction, and cost efficiency, BIM contributes to higher financial returns on investment and supports sustainability objectives within construction projects (Mi & Li, 2024).
5. Increased operational efficiency and decision-making quality. Enhanced data visualization and stakeholder collaboration facilitated by BIM improve decision-making efficiency, which is particularly critical for managing complex financial leasing contracts and long-term investments (Mi & Li, 2024; Agostinelli, Cinquepalmi, & Ruperto, 2019).

Persistent Barriers and Future Outlook

Despite the substantial benefits associated with digitalization, significant challenges persist. These include the need for large-scale investments in digital technologies and human capital, the absence of a unified digital environment, insufficient regulatory and legal support, and limited availability of high-quality market data (Table 2).

Table 2. Status and Challenges of Digitalization in the Construction Sector in Ukraine

Indicators	Problematic Aspects

Level of BIM implementation	High implementation costs, shortage of qualified personnel
Use of digital platforms	System fragmentation, lack of a unified digital environment
Integration with leasing instruments	Regulatory and legal framework gaps, limited access to financing
Online access to the real estate market	Limited analytics, unstructured property listings

Source: systematized by the authors

Furthermore, digital transformation does not generate immediate outcomes. Construction firms must navigate complex change management processes and adapt to evolving market conditions. Resistance to organizational change, legacy practices, and data integration challenges may hinder effective decision-making, particularly in traditionally structured segments of the construction industry (Fonseca, Benito, & Piña Ramírez, 2024).

Policy Implications

The findings of this study carry important implications for policymakers, regulators, and industry stakeholders involved in the modernization of the construction and real estate sectors. First, national and sectoral policies should prioritize the creation of a unified digital construction ecosystem, ensuring interoperability between BIM platforms, digital real estate marketplaces, and financial leasing systems. The establishment of standardized digital protocols would significantly reduce information asymmetries, enhance transparency, and facilitate cross-sector coordination between developers, financial institutions, and regulatory bodies (Aliyev, 2025).

Second, targeted institutional support mechanisms are required to accelerate BIM adoption. These may include fiscal incentives, public–private partnership schemes, and state-supported training programs aimed at addressing the shortage of qualified digital construction professionals. Without deliberate investment in human capital, technological advancement alone will be insufficient to deliver sustainable productivity gains.

Third, regulatory frameworks governing financial leasing and property registration must be aligned with digital construction practices. The introduction of smart contracts, electronic certification of properties, and blockchain-based registries would strengthen legal certainty, reduce transaction costs, and enhance investor confidence. Such measures are particularly relevant for Ukraine, where post-war reconstruction and housing affordability demand scalable, transparent, and risk-mitigating financial solutions.

Finally, public authorities should encourage the use of data-driven market analytics, including Big Data and AI-based tools, to improve price predictability and demand forecasting in real estate markets. Enhanced analytical capacity would support evidence-based policymaking and contribute to macroeconomic stability through more efficient capital allocation.

Managerial Implications

From a managerial perspective, the results underscore the necessity for construction firms and real estate developers to adopt strategic digital leadership. Digitalization should not be approached as a purely technological upgrade but rather as a comprehensive organizational transformation encompassing governance structures, workflow redesign, and stakeholder engagement.

Managers are encouraged to integrate BIM into both operational and financial decision-making processes, particularly in projects financed through leasing mechanisms. By embedding BIM-generated data into financial planning, risk assessment, and contract management, firms can improve project predictability, reduce cost overruns, and enhance accountability to investors and lessors.

Moreover, construction companies should actively engage with digital platforms that facilitate collaboration with financial institutions and real estate market participants. Such platformization enhances speed, transparency, and trust, which are critical for maintaining competitiveness in increasingly digitized construction markets.

Limitations of the Study

Despite its contributions, this study is subject to several limitations. First, the analysis is primarily focused on the Ukrainian construction sector, which may limit the generalizability of the findings to countries with different institutional, legal, or financial environments. Second, while the study provides a comprehensive conceptual and strategic framework, empirical validation using firm-level or project-level data remains limited. Third, the rapidly evolving nature of digital technologies implies that some solutions discussed may require continuous updating as new tools and standards emerge.

Directions for Future Research

Future research may extend this study in several directions. Empirical investigations using quantitative data could assess the measurable impact of BIM and digital leasing platforms on project performance, investment returns, and housing affordability. Comparative cross-country studies would also be valuable for identifying best practices and institutional configurations that support successful digital transformation in construction.

Additionally, further research could explore the role of artificial intelligence, digital twins, and blockchain technologies in enhancing the resilience and sustainability of construction projects under leasing-based financing models. Particular attention should be given to post-conflict and post-crisis reconstruction contexts, where digitalization may serve as a catalyst for rapid, transparent, and inclusive economic recovery.

Conclusion

Strategic management in the construction sector under conditions of accelerated digital transformation necessitates the adoption of fundamentally new management paradigms grounded in a systemic and integrated understanding of the interrelationship between the real estate market and financial leasing mechanisms. The findings of this study demonstrate that digitalization should not be perceived merely as an auxiliary instrument for improving operational efficiency; rather, it constitutes a structural prerequisite for sustainable economic development, investment stability, and long-term competitiveness of the construction industry.

The integration of digital technologies—particularly Building Information Modeling (BIM), digital platforms, and data-driven analytical tools—with financial leasing instruments creates a synergistic effect that significantly lowers investment barriers, enhances transparency, and improves predictability across construction and real estate markets. By streamlining project planning, execution, and monitoring processes, digital solutions reduce information asymmetries, mitigate financial and operational risks, and accelerate project implementation cycles. These outcomes are especially critical for attracting long-term investment and ensuring the reliable fulfillment of leasing contracts in capital-intensive construction projects.

Furthermore, the research highlights that the convergence of digitalization and financial leasing strengthens the investment attractiveness of real estate by transforming construction projects into more predictable and manageable assets. Digitalized workflows and integrated financial instruments enable investors, developers, and lessors to make more informed decisions, optimize resource allocation, and reduce exposure to cost overruns and delays. In this context, digitalization serves not only as a technological advancement but also as an institutional and managerial innovation that reshapes the governance of construction and real estate development.

From a policy perspective, the proposed strategic measures provide a robust foundation for the formulation of national policies on digital construction development. The establishment of a unified digital environment, the harmonization of regulatory frameworks, and targeted investments in digital infrastructure and human capital are essential for ensuring the effective implementation of digital transformation strategies. Such policies are particularly relevant for economies undergoing structural transformation and post-crisis recovery, where transparent, efficient, and scalable construction solutions are required to meet housing and infrastructure demands.

In conclusion, the strategic alignment of digitalization with financial leasing and real estate market mechanisms represents a critical pathway toward sustainable growth in the construction sector. By fostering innovation, reducing risks, and enhancing transparency, this integrated approach contributes to economic resilience, social welfare, and long-term development objectives.

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Conflict of Interest

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The authors declare that no generative artificial intelligence tools were used in the creation of this manuscript.

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